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AN INVESTIGATIVE STUDY OF AIR FORCE
ACQUISITION MANAGEMENT WORK WITH
THE INTENT OF IDENTIFYING ITS
NATURE AND REQUIRED TOOLS

THESIS

Mark C. Cerise
Captain, USAF

AFIT/GSM/ENC/88S-3

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DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
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Wright-Patterson Air Force Base, Ohio

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AN INVESTIGATIVE STUDY

OF

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WITH THE INTENT OF IDENTIFYING

ITS NATURE AND REQUIRED TOOLS

THESIS

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Systems Management

Mark C. Cerise, B. S.

Captain, USAF

September 1988

Acknowledgements

The purpose of this study was to better understand the primary work activities of Air Force acquisition managers and the tools that are facilitating acquisition management work. A sound understanding of managerial activities is required for effective development of management processes, education, training and tools.

Over one-hundred Air Force middle-level acquisition managers were surveyed as part of this study. The survey instrument was strenuous and time-consuming. The personal time and effort each manager took to be a part of this research is deeply appreciated and reflects the top-quality people working in Air Force acquisition today. These managers are the real story.

This thesis was a project that must be managed--as such--the successful completion of this work was contingent upon the commitment and support of my network of help. My wife, Corinne, was instrumental in putting this 'book' together. She is a manager in her own right--and an excellent one at that. Her naturally-developed command of the English language puts most postgraduate students to shame.

The real motivational force behind this thesis was Daniel E. Reynolds--my advisor, teacher and friend. Dan

Reynolds is setting lofty standards for what is expected of a teacher at the Air Force Institute of Technology. What's even more exciting is that everyday he comes to work, he looks for ways to raise those standards. The highlight of my schoolyear is the cohesive learning environment he and I experienced together.

It is a gross oversight not to acknowledge the real GIANTS of management and organizational study--people like Mintzberg, Kotter, Stewart, Fayol, Daft, Luthans, Beer, Boulding and several others. We students struggle to climb up to their shoulders for just an instant to catch a glimpse of their vision.

Mark C. Cerise

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Abstract

This ~~study~~ thesis attempted to broaden previous management work research by investigating the primary work activities of middle-level Air Force acquisition managers and the tools being used to facilitate acquisition work.

Previous research has focused on directly observing civilian managers in actual work settings. In general, these studies have characterized managerial work as busy, fragmented, primarily linguistic, and comprised of numerous daily contacts. Managers often communicated via informal conversations. This preference for informal face-to-face conversation resulted from the manager's need to match a communication medium capable of conveying rich information to an uncertain work environment. It was hypothesized that Air Force acquisition managers worked in this type of environment.

A questionnaire was used to survey a group of 100 Air Force middle-level acquisition managers. Most of the managers indicated they were working in a fast-paced environment characterized by a large number of daily contacts and work issues. Most of the managers worked long days and spent little time by themselves. The most common

work activities were conversations with others, reading and writing. Coordination was consistently ranked as one of the more frequently exercised management functions. These managers felt that conversations for action best typlified their most frequent linguistic activities and showed a strong preference for informal communication media.

Most of the research subjects frequently used the telephone, a pencil or pen, and the computer. Computers were primarily used for word processing--in other words--its use was a function of its capability to facilitate linguistic acts.

Several recommendations for additional research were proposed and an argument was made for changing the present structure of management education.

Keywords: information systems, communications networks (KR)

AN INVESTIGATIVE STUDY
OF
AIR FORCE ACQUISITION MANAGEMENT WORK
WITH THE INTENT OF IDENTIFYING
ITS NATURE AND REQUIRED TOOLS

I. **Introduction**

It seems to me that until we get into the question of
what the top manager does or what the functions are
that define the top management job, we're not going
to get out of the kind of difficulty that keeps
cropping up. What I'm really doing is leading up to my
earlier question which no one really answered. And
that is: Is it possible to try to arrive at a
specification of what constitutes the job of a top
manager [Myers 1967:198]?

General Subject Area

At some point in time, during the initial design of the

hammer, someone very likely attempted to understand the

nature of the carpenter's work. After some thinking, and

perhaps some research, the design of the hammer evolved.

The interaction between the hammer and carpenter requires

little reflection on the part of the carpenter. Indeed, the

interaction between the hammer and carpenter is transparent.

The tool and user act as one. This well-designed coupling

results in the enhancement of an activity essential to the

work of the carpenter. The developmental approach described

above seems reasonable as tools should be designed to aid

the human being in accomplishing his or her job--and at the

same time--be transparent in use (Winograd and Flores,

1986:164).

It is also conceivable that carpenters would rarely use a tool which contributes little towards the completion of their work. Such a tool could have been designed, produced, procured--and then misapplied--by incorrectly assessing what carpenters do. The failure to study and understand the primary activities of human work increases the probability of designing tools that will not be utilized on a frequent basis.

Using similar reasoning, other issues can also be addressed. Recently, the microcomputer has been introduced into the military and civilian management structure. These tools have been introduced with the intent of improving management information, control and decision-making (Coleman, 1955:108; Jones, 1970:75-89; Zuboff, 1982:142-152). Stated differently, microcomputers have been provided to help managers complete their work just as a hammer was provided to assist the carpenter. Why then is there considerable documentation regarding the relative underutilization of computer-based decision aides by the manager (Parnell and Triscari, 1987:6; Leavitt, 1975:5; Ecung, 1983:9)? At the root of this question lies the driving force for this research--the possibility we are not recognizing the predominant activities of managerial work. A major misconception as to what the manager primarily does warrants the extensive review of previous literature and conduct of additional research.

The major issue resulting from the previous discussion
is not how we can better utilize computers; but rather,
what are managers doing when we say they are working?
Only after first addressing the management work question can
we then begin to talk about the design of tools to help
managers (Beer, 1981:16-17). If there is a sound
understanding of what managers do, technological
applications can be designed to complement and accelerate
the successful completion of management work.

A common image of the manager is an individual who
controls, coordinates, organizes and directs people,
materials and money along some 'program of action' (Fayol,
1975:141). Almost immediately an organizational structure
comes to mind. At the top of this structure comes titles
such as plant manager, marketing manager or program manager.
This image comes complete with the Fayol functions of
organizing, coordinating, planning, controlling and
commanding (sometimes called direction). In fact, both past
and current management textbooks are often subdivided into
these major categories (Carroll and Gillen, 1987:38). The
act of decision-making often dominates this picture and
forms the basis of a discipline called management science.
In management science, decision-making 'is regarded as the
central task of management' (Winograd and Flores, 1986:20).
It follows that tools originating from management science
would focus on decision-making--tools designed to help the

manager find some "best course of action" (Markland, 1983:6-7)). It is not surprising, therefore, to find so much effort geared towards the study, development and acquisition of decision support systems. In general, the designers of these tools claim their use will increase the "effectiveness" of management decision-making in "semi-structured tasks" (Keen and Scott-Morton, 1978:1). Quite often, these tools are implemented on microcomputers. Recently, there has also been an effort to assess whether artificial intelligence (specifically expert systems) has a place in improving Air Force acquisition management decision-making (Parnell and Triscari, 1987:1). Certainly it is logical these tools will be frequently used if managers make numerous decisions and work in a semi-structured environment. These tools appear designed for organizations which assign managers the primary responsibility of making decisions equally weighing variables such as cost, schedule, performance and supportability (Department, 1982:3).

Some management researchers and popular writers have questioned whether the decision-maker label actually obscures the real essence of managerial work. This questioning process has resulted in a "new understanding" of managerial work--an understanding based on the premise that a manager's primary concern is requesting and receiving support and commitment from others (Flores and Bell,

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1984:180). This understanding places the manager at the center of a network of help--a network that facilitates commitment through conversation.

Over the past decade, the work environment of the manager has undergone change at an increasing rate (Ecung, 1983:9). This constant change is characterized by the 'need to manage complexity' (Beer, 1975:15). Managers must now--more than at any time before--work with numerous organizations both internal and external to their system of responsibility. This work is characterized by the need to work with people, not control and command them (Hawken, 1987:21). Managers are now more dependent on people outside their realm of control--and in many cases--these people have competing demands on their own time as well (Fox and Morrison, 1985:2). The 'fundamental management challenge' is one of gaining the cooperation and support of these people (Fox and Morrison, 1985:2). Often, managers must design their own networks of help and consider not only how they will gather information, but also how information will be effectively disseminated (Mintzberg, 1971:B-108). The complexity of this task is amplified by large numbers of players, who have more freedom, and who undergo more system-wide disturbances (Beer, 1974:11). In short, there is great variety and uncertainty. This environment creates the requirement to converse quickly and effectively.

A new type of tool is being developed and marketed to support this conversation need. These 'work group productivity' or networking tools are geared towards teamwork and group communication (Spotlight, 1986:1). Some work group tools are just now reaching the marketplace; and once again, the primary implementation vehicle is the computer (often the microcomputer). The design of these tools is predicated on the belief that 'every manager is primarily concerned with generating and maintaining a network of conversations for action'--a communication network critical to the successful completion of management work (Winograd and Flores, 1986:144). Work group tools appear designed for organizations that feel the most important function of the manager is 'getting people to communicate with each other to achieve a common understanding of the needs of the program and their place in the harmony of the total program effort' (Defense, 1979:2).

To question whether a manager is a communicator or decision-maker is pointless. In some manner, most all managers exercise both of these roles and more. A more significant concern, however, is whether either label misrepresents the real essence of managerial work. Both of these roles represent 'abstract terms'--and as such--can obscure 'concrete, observable' activities (Davis and Luthans, 1980:69). The more practical question is asking whether managers spend the majority of their time in active

conversation with others as opposed to reflective activities associated with decision-making (or the converse). If a manager makes one decision a year and spends the rest of that time period in constant conversation with others trying to make that commitment become a reality, tools helping managers make decisions will be seldom used. In contrast, this manager will be in constant need of tools that facilitate conversation.

What are managers primarily doing when we say they are working? A better understanding of the answer to this question should clarify the primary needs of the manager. These needs can be satisfied in the form of properly designed tools and education. This process is analogous to the way the Department of Defense develops weapon systems. An operational command has a mission which determines the nature of the command's work. The operational units have need of tools and training to successfully complete their work. Weapon Systems are designed to satisfy the operational needs and training programs developed to support usage of weapon systems. This process is continuous. The environment changes, the work changes, the needs change, the tools and training change, the research never stops.

Research Focus

What activities best describe the primary nature of

Air Force acquisition management work and what tools are required to facilitate this work?

Purpose of Research

The purpose of this research is to attain a better understanding of the primary work activities of Air Force acquisition managers. The objective is to provide some initial descriptive and qualitative understanding of acquisition management work. In addition, this study addresses the use of tools that can facilitate this work. This research focuses on individuals who have middle-level management responsibilities within the Air Force acquisition environment. The objective of studying middle-level managers reflects an attempt to balance previous research designs that have often focused on executive-level managers. While similar research has been conducted in the civilian sector, few studies of this kind have been conducted on Air Force managers. This research attempts to fill that void.

A review of previous literature was considered crucial in attaining the conceptual understanding required for this research; as such, a secondary objective was the accomplishment of an extensive and integrated literature review. There are expectations that follow-on studies will be able to effectively focus on findings and recommendations that result from this study.

Additional Background

The initial motivation for this study resulted from reading a book titled <u>Understanding Computers and Cognition</u>, written by Professor Terry Winograd of Stanford University and Dr. Fernando Flores, Chairman of the Board, Action Technologies, Inc., California. Winograd and Flores believe more research should be devoted to the "definition of human actions" and creation of technology that can facilitate these actions (Kerr, 1987:118). Flores and Winograd view managerial work as a "domain of speech acts and conversations" (Winograd and Flores, 1986:144). The primary job of the manager is developing and maintaining a network that facilitates these conversations (Winograd and Flores, 1986:144). Their book, while primarily oriented to new directions in computer design, transcends beyond this subject into a complex discussion of human nature and human work (Winograd and Flores, 1986:xi).

This thesis contains discussion regarding the microcomputer and its management usage. Whether extensive planning preceded the introduction of microcomputers into the military management structure is questionable and perhaps better left to those who wish to study the past (Skahan, 1986:9). Today, microcomputers are part of day-to-day life in most all civilian and military offices. The future also appears computer-rich. The needs of management should continue to be addressed and clearly

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stated to ensure they are part of this future. With specific regard to the Air Force acquisition, microcomputer use and office automation 'cannot be avoided' and 'we have only scratched the surface' of its application in facilitating the successful completion of acquisition management work (Ecung, 1983:5).

Justification for Research

There are several reasons for the desire and need to better understand the primary activities of management work. First, management tools cannot be properly designed without a sound understanding of managerial activities and processes. A second reason is that management education should be responsive to the needs of the manager--as such--effective education also depends on a sound understanding of managerial activities. Further, the existence of a rapidly changing work environment dictates a continual need to verify this understanding with research.

The opening paragraphs of this thesis centered on the design of tools that complement human work. The introduction established that 'the nature of human actions has a profound influence on the shape of what we build and how we use it' (Winograd and Flores, 1986:xii). If we misjudge the nature of human work, we risk the possibility of providing poorly designed tools. The opening quote in the introduction represented the frustrations of an

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individual attending a conference called to assess the
impact of the computer on the manager. Such frustrations
indicate that technological advancements can essentially be
wasted (Beer, 1974:89). If technology and science are to
help managers cope with the ever-increasing complexity of
their jobs, it is best to first understand--in as clear a
manner as possible--what managers do.

While science can help facilitate the manager's work,
education must prepare them for it. How can one
effectively educate managers without a basic understanding
of their work? In 1975, Henry Mintzberg challenged the
educational establishment for managers. His writings
recognized the 'admirable' job educational institutions were
doing in training organizational specialists--but he
questioned the general training of managers (Mintzberg,
1971:B-109). Mintzberg's descriptive research suggested a
need for more interpersonal skill training in management
schools and less emphasis on quantitative skills
(Mintzberg, 1975:61). Mintzberg also noted that 'the
progress of management science' was dependent on an adequate
understanding of the manager's actual work behavior
(Mintzberg, 1971:B-109). Daft and Wiginton also recognized
the emphasis on developing quantitative decision skills in
business schools, but also felt more natural language skill
development should be encouraged (Daft and Wiginton,
1979:189). Rosemary Stewart observed management training

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often placed too much emphasis on Fayol's 'all-to-often quoted' management functions (Stewart, 1976:30). She emphasized, rather, the different demands, constraints and choices that managers faced (Stewart, 1976:22-32).

The demands, constraints and choices of the manager are continually changing. Machines and organizational structures suitable for human purposes yesterday, no longer satisfy our needs. This rapidly changing environment increases the probability that the nature of human work is continually changing as well. Continuous research must be conducted to keep pace with this changing work environment. This also implies that both management education and industry should be responsive to the changing environment as well.

In summary, a better grasp of managerial activities is both organizationally and educationally valuable. There will always be justification for this type of research. In recent decades, popular writers and consultants have undeniably influenced the managers of this country (Luthans, 1986:3). In some sense, this should be taken up as a challenge by management researchers--a challenge to balance 'management by best seller' with 'management by research results' (Luthans, 1986:10). The ultimate value of both popular writing and research is the potential increase in

the functionality of organization--both in the Air Force and elsewhere.

Limitations of Research

The findings resulting from this research are limited by the breadth and complexity of the subject. For example, this research focuses on Air Force acquisition management. Even within the Air Force, there are several other managerial environments that have different demands, constraints and choices. The managerial activities that characterize the acquisition environment may be significantly different than other managerial domains. Fred Luthans, during his 1986 Presidential Speech to the Academy of Management, reminded his audience that management researchers 'are dealing in a very difficult, almost impossibly complex and diverse field' (Luthans, 1986:9). This complexity implies that potential readers should be cautious when making precise inferences from the results of any management study. While this limitation lowers the probability of reaching definitive conclusions, it also sustains a continuous motivation for more management research and thought.

Research Overview

This thesis will follow a five chapter format with the literature review, methodology, results and conclusion

following this introduction. A flow diagram of the thesis is presented in Figure 1.

Reading the literature review is crucial for an understanding of this thesis. The literature review (Chapter II) is divided into four parts. The first section presents some general themes and ideas regarding the study of management and possible management tools. This discussion is followed by a review of previous research by individuals who have studied and described what managers actually do. The writings and research of Mintzberg, Kotter, Stewart, Luthans and several others are reviewed. The third section describes additional management topics motivated by the observational studies of managers at work. These topics include the interaction of language and management, the role of the manager's network of help, and the concept of the adaptive manager. The first three sections prepare the reader for a final section describing the views documented in <u>Understanding Computers and Cognition</u>. This discussion is mixed with a moderate review of proposed management tools such as decision support systems and networking tools. The literature review is substantial and provides a satisfactory conceptual basis for investigating the nature of Air Force acquisition management work.

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Chapter 1 (Intro) — Introduction:
- state background,
purpose & agenda.

Chapter 2 (Lit) — Literature Review:
- build conceptual
understanding.

Chapter 3 (Method) — Methodology:
- present research
design.

Chapter 4 (Results) — Results:
- show data &
analysis.

Chapter 5 (Summary) — Conclusion:
- Summarize findings
& recommendations.
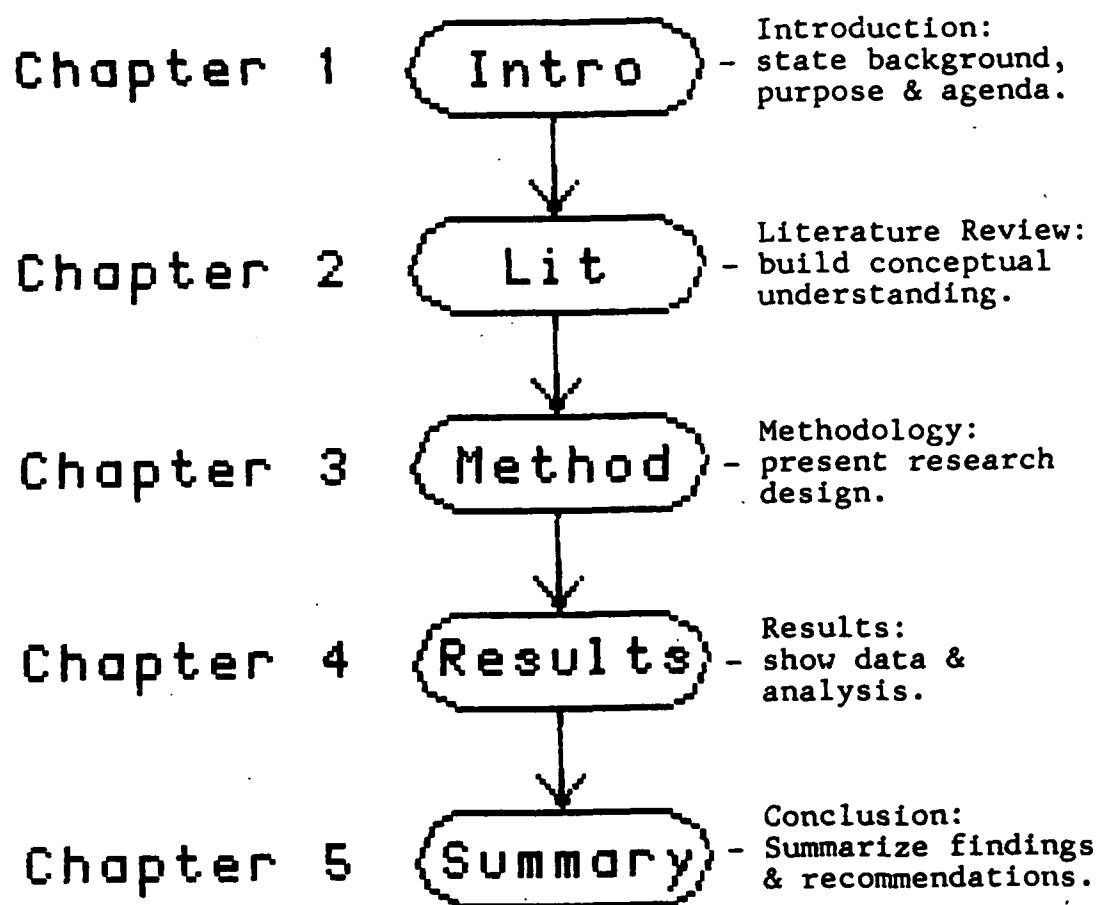
Figure 1.   Thesis Flow Diagram

The methodology (Chapter III) describes how this research was conducted. It begins with a general description of the research design. This is followed by more detailed sections describing the sampling plan, survey instrument and strengths of the research design. Next, the research hypotheses and investigative questions are presented. The final section describes the data analysis and presentation techniques.

The results (Chapter IV) of this research are presented in four parts. First, the demographics and background of the research subjects are presented. Next, the characteristics of their work environment are described. The final two sections present the work activities of Air Force middle-level acquisition managers and the primary tools that are facilitating their work. The results are presented in a manner that permits a gradually increasing understanding of the research focus.

The conclusion (Chapter V) recaps the literature review, methodology and results. Recommendations for further research are proposed and an argument for change is made.

There are five appendices that follow directly after the conclusion. Appendix A presents the survey instrument (a questionnaire). The remaining appendices document recorded verbal responses to some of the questions in the

survey. The appendices are short in length, easy to scan,
and designed to complement the presentation of results.

II. Literature Review

The review of literature forms a conceptual basis from which the research focus can be addressed. This literature review opens with some general discussion describing the complexity of management research, the many theories that result from this complexity, and some preliminary thoughts on proposed management tools. This initial discussion sets the tone for the remainder of Chapter II. The second section presents a more detailed review of previous research dealing with the direct observation of actual managerial activities. Next, some additional subjects--motivated by research findings dealing with observed managerial activities--are described. These subjects include the role of language in managerial work, the networks of cooperation that support the manager, and the concept of the adaptive manager. The final section deals with the thoughts of Flores and Winograd--specifically their ideas on managerial work and tools required to facilitate this work. The chapter summary solidifies the conceptual foundation developed in the literature and hypothesizes about the expected work activities of middle-level Air Force acquisition managers.

A Beginning

An Important and Complex Subject. In 1955, Peter
Drucker wrote that the limiting factors in industrial
society were not raw materials or manufacturing equipment--
but rather--the supply of managerial talent and knowledge
(Smiddy, 1956:220). Some 30 years have passed, and while
the nature of society has changed, the importance of
managerial talent, knowledge and understanding has remained
constant. The objective of this chapter is to pursue some
initial understanding of managerial work by reviewing the
literature.

There is very little that is black and white in the
study of management. Kenneth Boulding served warning to all
management researchers when he recognized the difficulty in
reaching any empirical formulations concerning systems
dealing with human personalities and organizations
(Boulding, 1956:207). Boulding placed human organizations
at the eighth level of systems complexity (the ninth level
is the terminal level) and noted that only 'the rudiments of
theoretical systems' existed beyond the fourth level
(Boulding, 1956:206). Figure 2 exhibits Boulding's levels
of complexity and highlights the position of most management
research. Boulding's thoughts make clear the dangers in
accepting as final a level of theory that is below the
system level of world being researched (Boulding, 1956:207).
In regards to management, it is not so shocking that

HIGH COMPLEXITY
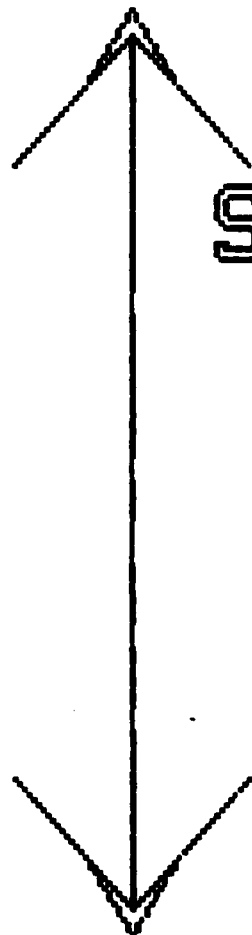
- Transcendental

Social Groups

- Single Human
- Animal
- Genetic-Societal
- Open System
- Cybernetic System
- Simple Dynamic
- Static Structure

LOW COMPLEXITY

Figure 2.   Boulding's Levels of Complexity

Adapted from Boulding, 1956:197-208

proposed theories and concepts occasionally lead to
incomplete answers.

The difficulty in researching such complex systemic
processes is a major reason for the many and varied
management theories. In 1961, Harold Koontz identified six
different management schools and concluded this 'Management
Theory Jungle' was in part created by the unwillingness of
management theorists to understand one another (Koontz,
1961:18-30). When Koontz revisited the same subject in
1980, he presented no less than eleven different approaches
to the study of management (Koontz, 1980:176). While Koontz
described some signs of hope, he concluded that the
'Management Theory Jungle' remained intact (Koontz,
1980:186-187). He also observed a widening gap between
practice and education (Koontz, 1980:186-187). Koontz and
several others felt practicing managers should take a more
active role in reducing this gap.

On the schoolhouse side, attempts to reduce this gap
are reflected in the work of Henry Mintzberg. Mintzberg
popularized research designs dealing with the observation of
what managers actually do and then drawing conclusions
regarding primary managerial activities (Koontz, 1980:181).
Classical observational studies of managers can be dated
back to 1951 when Sweden's Sune Carlson published
Executive Behavior: A Study of the Workload and the

Working Methods of Managing Directors (Davis and Luthans, 1980:80). Mintzberg's work, however, has focused considerable stateside attention on the primary work activities of managers. While Mintzberg is often quoted for his portrayal of Fayol's classical management functions as 'folklore', he too offers no statements to the effect that his proposed managerial roles are totally adequate either (Mintzberg, 1975:49).

The Role of the Computer. Some 30 years ago, the computer was talked about as a tool for managers (Coleman, 1956:107). Even then there was concern that the computer not be considered just a data processing device. In management circles, the computer was considered more significant as a tool to aid decision-making (Coleman, 1956:108). In 1955, Russell Ackoff wrote about 'connecting the brain with a data processing system' where under particular conditions management could determine what should be done to their operation to get optimum results (Ackoff, 1955:58). Ackoff was careful to point out that most complex problems would still not be capable of complete automation-- especially those problems that involve ethical or political intangibles (Ackoff, 1955:60). In the next decade, Ackoff would go on to warn about 'Management Misinformation Systems' where managers suffered from an 'overabundance of irrelevant information' (Ackoff, 1967:B-147). In this decade, information strategist Paul Strassman has observed

that many executives are spending 'too much money on computer systems that allow them to do the wrong things faster' (Strassmann, 1988:27). The computer, like any tool that is misapplied, can work equally well against you as for you.

As promised in the early 70's, telecommunications has arrived in this decade. In telecommunications, technology has provided the manager the capability to participate in worldwide conversations and have access to vast computer resources (Carne, 1972:125). Further, this capability can be provided to the manager in the office or at home. Telecommunications can also be used for both private and public communications--as such--both formal and informal networks can be supported.

The question again becomes one of proper design and application. A desired goal for any management tool is that it act as a force multiplier for the manager. It should be able to increase the amount of variety the manager can absorb, then help amplify the required management action. This force multiplication can be achieved by designing and then placing into application tools that enhance primary management activities.

The Research of Management Work

This section reviews the work of several individuals who have observed actual managerial work. The research

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of Mintzberg, Kotter, Stewart, Luthans and several others
are reviewed.

Henry Mintzberg. Reviewing the work of Henry
Mintzberg is an excellent means of initiating a discussion
of what managers actually do. Mintzberg is widely
referenced in several of today's management and information
systems texts, and is credited with motivating considerable
follow-on research. In Mintzberg's mind, it was essential
to understand the nature of management work. Without this
understanding, it would be difficult to teach management,
design tools to help managers, or improve management
processes (Mintzberg, 1975:49).

Mintzberg considered Henry Fayol's classical management
functions of planning, organizing, coordinating, controlling
and commanding as 'vague' and recommended what he thought
was a more 'supportable' view of what managers actually do
(Mintzberg, 1975:49-50). His doctoral research produced
several findings that were in contrast to classical views.
First, he found that managers were not 'systematic'
thinkers; rather, they worked at an 'unrelenting pace',
were 'strongly oriented to action' and disliked
'reflective' activities (Mintzberg, 1975:50). He also
found that managers did not favor formal information
systems--to the contrary--they spent 80% of their time in
oral conversation on the telephone or in meetings

(Mintzberg, 1975:52). Mintzberg also argued that managers
did not practice a science; rather, their actions appeared
more ad hoc and intuitive as opposed to systematic or
programmed (Mintzberg, 1975:54). Several others have sided
with this view of the manager. Harold Leavitt wrote that
the 'promise' of more quantitative, computer-assisted.
managers had not become a reality--especially in regards to
decision-making (Leavitt, 1975:5). Thomas J. Peter's
research of ten (10) well-run American companies indicated
an avoidance on the part of management to use complicated
processes or overanalyze ideas (Peters, T. J., 1980:196).
In contrast, the management of these companies expressed a
'bias towards action' often reflected in the practice of
doing it, fixing it and trying it (Peters, T. J.,
1980:196). The following quote from Mintzberg best sums up
his motivation in management research:

> It's time to open things up. We've had a long period
> this century describing only one side of management,
> the highly structured side. But there is another
> hidden, unstructured side [Bickerstaff, 1981:35].

The difficulty in researching the more unstructured side of
management is in part due to the possibility that managers
may not want to share the fact that unstructured techniques
guide their most important commitments (Agor, 1986:17).
Mintzberg supports this conflict when he says that

> You can't justify anything on the basis of intuition
> today. It must be on the basis of analysis. That's
> why the entrepreneur can be so creative; he is
> accountable to no one [Bickerstaff, 1981:34].

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Mintzberg did open up the more unstructured side of
managerial behavior. His research focused on observed
management activities, the information they process, the
people they work with, where they work, and the frequency of
their activities (Mintzberg, 1973:3). The subjects for his
initial research (late 60's-early 70's) were executive-level
managers of middle to large sized companies. The bulk of
his findings are published in a book titled <u>The Nature of</u>
<u>Managerial Work</u>. The following are some of the managerial
work characteristics his research discloses:

    a. Managers work hard, have little free time and often
       take their work home (Mintzberg, 1973:51).

    b. Most activities are brief, fragmented and often
       interrupted. This hectic schedule makes managers
       appreciative of the 'opportunity cost' of their own
       time (Mintzberg, 1973:51).

    c. Managers prefer current activities. 'Live'
       information including speculation are favored--
       routine reports and mail are not (Mintzberg, 1973:
       51-53).

    d. Oral and written contacts are the manager's work.
       Equipment and functions (like meetings)
       facilitating these media are the 'prime
       tools'--most managers prefer oral contact
       (Mintzberg, 1973:52).

    e. The five primary media of the manager are mail, the
       telephone, unscheduled meetings, scheduled meetings
       and tours. Face-to-face meetings consume more time
       than any other media (Mintzberg, 1973:52).

    f. Despite the complexity and reactive nature of their
       work, managers appear to have some control over
       their daily agendas as they are responsible for
       'many initial commitments' and take advantage of
       obligations by gaining information and 'exercising'
       leadership (Mintzberg, 1973:53).

Figures 3 and 4 pictorially present a more quantitative summary of the managerial activities observed by Mintzberg. These figures provide empirical evidence that meetings (face-to-face conversation) make up a big part of the manager's workday.

Mintzberg viewed managers as standing between their organizations and the environment (Mintzberg, 1973:55). From this viewpoint, Mintzberg postulated ten working roles categorized under interpersonal, informational and decisional labels. Most textbook discussion of Mintzberg's research focus on these ten roles (Carroll and Gillen, 1987:39). These roles are presented in Figure 5. Of note in Figure 5 is the absence of planning as a managerial role. Mintzberg did not see planning as an 'integral' part of managerial work (Snyder and Glueck, 1980:70). One explanation for Mintzberg's reasoning on planning (other than the fact he did not observe reflective and systematic activities one would expect to see in planning) might be his vision of the planner and the manager as two different people. Some of Mintzberg's earlier writings discuss the interaction between the planner and manager and depict a considerable 'dilemma' between the two individuals (Hekimian and Mintzberg, 1968:5). Planners felt that their plans were ignored by managers, and managers felt that plans were 'irrelevant' because they did not account for 'lack of time' and 'unanticipated problems' (Hekimian and Mintzberg,

DISTRIBUTION OF HOURS
MINTZBERG − 1973
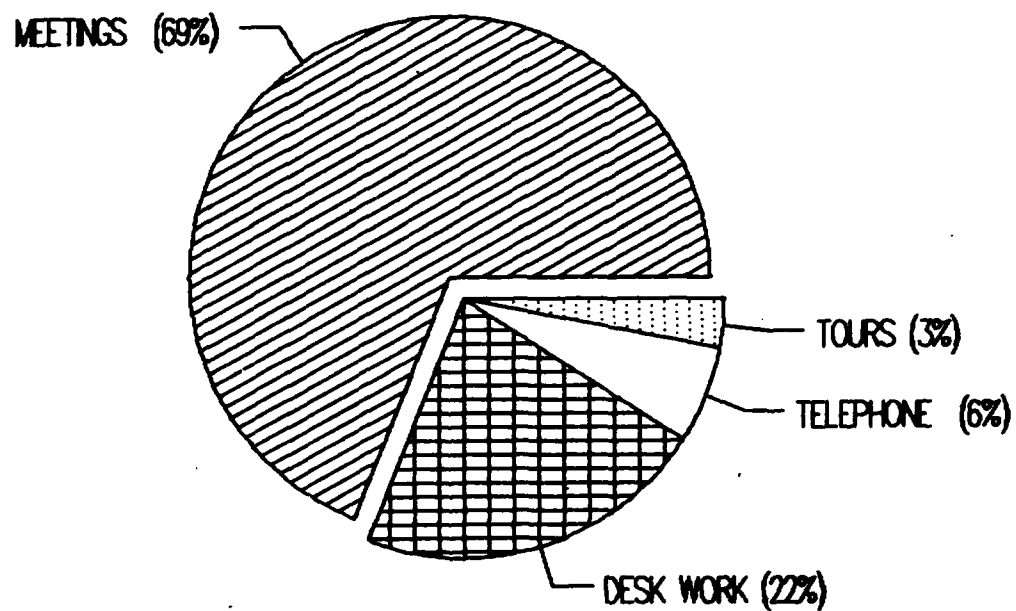
Figure 3.   Distribution of Hours
Mintzberg − 1973

Adapted from Mintzberg, 1973:39

DISTRIBUTION OF NUMBER OF ACTIVITIES
MINTZBERG - 1973
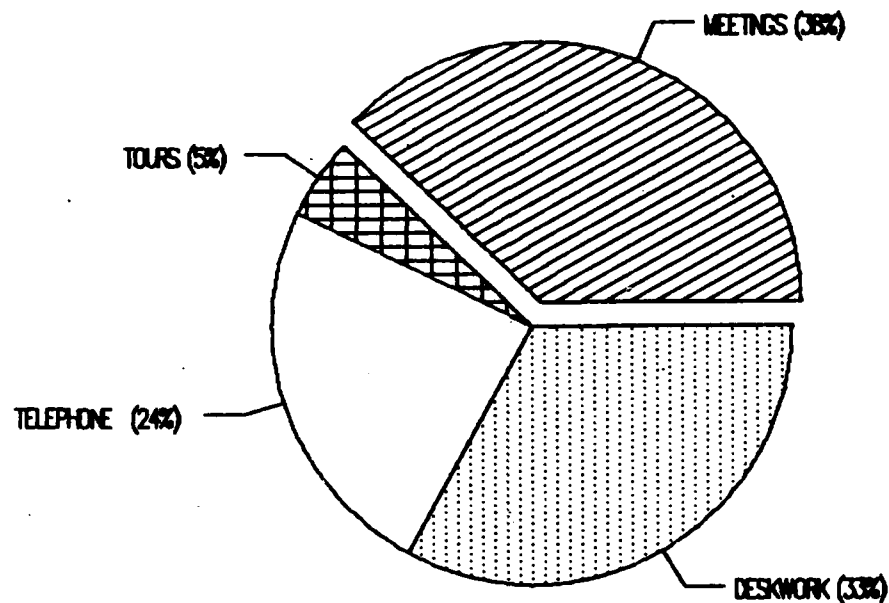
Figure 4. Distribution of Number of Activities
            Mintzberg - 1973

Adapted from Mintzberg, 1973:39

$\overline{(\text{MANAGER})}$

↓

INTERPERSONAL ROLES
Figurehead

Leader

Liaison

↓

INFORMATIONAL ROLES
Monitor

Disseminator

Spokesman

↓

DECISIONAL ROLES
Entrepreneur

Disturbance Handler

Resource Allocator

Negotiator
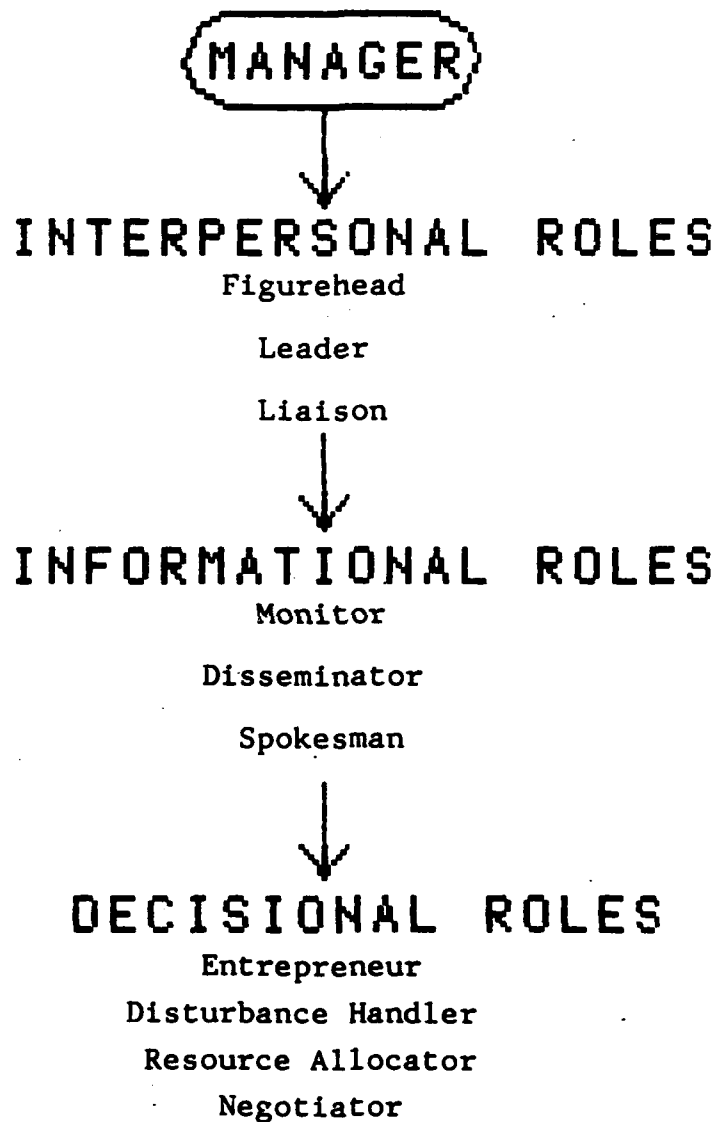
Figure 5. Mintzberg's Managerial Roles

Adapted from Mintzberg, 1973:59

1968:5-7). Regardless of whether Mintzberg thought planning was a managerial role, his writings indicate that planning and managing must be 'closely integrated' and this meant that planning must be adaptable--if not continuous in real-time (Hekimian and Mintzberg, 1968:14-17).

While Mintzberg criticized Fayol's management functions as being vague, he too proposed a set of roles that have proven to be just as abstract. Some studies have attempted to substantiate Mintzberg's roles and found that many activities overlap roles that Mintzberg considered separate (Carroll and Gillen, 1987:39). McCall and Segrist (using a questionnaire) had difficulty validating four of Mintzberg's roles, but they did support Mintzberg's hypothesis that different managerial jobs (different levels and functions) would emphasize different roles (McCall and Segrist, 1980:11). Another survey (a questionnaire) of 210 government managers 'using Mintzberg's framework' found four factors instead of ten roles (Carroll and Gillen, 1987:39). Kurke and Aldrich (who directly observed executive-level managers) supported Mintzberg's 'management work setting characterized by fragmentation, brevity and concentration on live media'--but their research design did not take on the more difficult and abstract task of validating Mintzberg's managerial roles (Kurke and Aldrich, 1983:983). While these studies tend to question the specificity of Mintzberg's role theory, the research of Kurke and Aldrich does lend

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credibility to the observational methodology used by
Mintzberg and some of his descriptive generalizations
regarding executive-level managers.

In summary, Mintzberg's research is commended by others
for providing more realism to the description of the manager
(Carroll and Gillen, 1987:40). His work represents an
effort to directly examine events in an actual organization.
Mintzberg observed a discontinuous and reactive behavior on
the part of his research subjects. This behavior contrasted
with activities he expected to see from managers exercising
more traditional (Fayol) functions. His initial research
did not directly address the differences in how managers
might carry out their jobs at different levels (all his
subjects were executive-level managers). His managerial
roles are mentioned in several management textbooks but
rarely are they integrated with Fayol's classical functions
(Carroll and Gillen, 1987:38). While Mintzberg questioned
Fayol's classical management functions, his research
findings were not so overwhelming as to dismiss Fayol's
functions as irrelevant. The real legacies of Mintzberg's
research are the questions he forces us to continually
answer:

> If we do not understand what constitutes the top
> manager's job, how can we measure the impact of the
> computer on his work? In fact, how can we design
> useful management information systems or planning
> systems for him? If we do not know what managers
> do, how can we claim to teach management to students in
> business schools? How can we expect management

development programs to improve the performance of
practicing managers? And, if we cannot influence the
way managers work, how can we hope to enable our large
bureaucracies to cope with problems that today appear
insurmountable [Mintzberg, 1973:3]?

John Kotter. Like Mintzberg, Kotter observed that

a 'rather large gap' existed between the conventional wisdom

on management functions and actual managerial behavior

(Kotter, 1982:156). Kotter's research focused on 15 general

managers in nine organizations. His results are basically

consistent with those of Mintzberg--Kotter also had a

difficult time 'reconciling' observed management behavior

into Fayol's functional categories (Kotter, 1982:159).

Kotter observed that managers spent little time by

themselves. To the contrary, managers spent most of their

time with others; specifically, they were involved in

conversations with people both inside and outside of their

organizations (Kotter, 1982:159). These conversations were

characterized by a wide range of subjects, some humor,

joking around (some concern for non-work related issues)

and few decisions or orders (Kotter, 1982:159). These

managers often tried to influence conversation

participants--sometimes through 'intimidation' and

'cajoling' (Kotter, 1982:159). Similar to Mintzberg's

findings, these general managers also worked long hours with

much of the day appearing unstructured or unplanned.

Despite the appearance of what seemed to be 'hit or miss' behavior, Kotter observed a great deal of effectiveness in his research subjects (Kotter, 1982:160). Each manager tried to work to an agenda, build a 'network of cooperative relationships' with people to help achieve this agenda, and exercise interpersonal skills to influence the execution within this network (Kotter, 1982:160-163). Kotter's findings are consistent with those found in other research--especially in regards to managers setting goals and agendas--then moving their organizations in that direction (Carroll and Gillen, 1987:44). In this manner, Kotter's managers are similar to Mintzberg's research subjects who pursued a daily agenda despite frequent interruption. Kotter is widely referenced in regards to his research and writings concerning network building--'responding to the needs of other managers rather than satisfying one's needs' (Carroll and Gillen, 1987:44).

Kotter was also critical of management schools that overemphasized quantitative tools and simple, unambiguous problems--those that dealt 'simplistically with human relationships' (Kotter, 1982:166). Kotter felt that while such a curriculum might be helpful--it was hardly 'central' (Kotter, 1982:166). Carroll and Gillen support this view with their conclusion that 'reality is far messier than the descriptions of manager's problems found in textbooks' (Carroll and Gillen, 1987:45).

<u>Rosemary Stewart</u>. Stewart conducted considerable
managerial research throughout the 60's, 70's and early
80's. She, like Kotter and Mintzberg, initially gave us a
more 'reactive' and 'political' view of actual managerial
behavior (Stewart, 1979:34). She also sharpened and
expanded on previous management work research--especially in
regards to differences in management jobs and agendas.

While Mintzberg's initial research hints that
managerial jobs are fundamentally alike, Stewart tempers
this view by highlighting the different demands,
constraints, and choices in managerial work (Stewart,
1976:22-32). Not all managers worked at an unrelenting
pace, for some there was a choice (Stewart, 1987:7).
Managerial demands could be affected by supervisors, peers,
subordinates and external contacts. Constraints could be
physical, political, technological, organizational or result
from limited resources. Choice refers to the opportunities
and freedom managers have to work on what they want and at a
pace they want (Stewart, 1976:27). Stewart's research
serves as a caution against overgeneralizing research
findings dealing with managerial work and behavior; as such,
it reflects 'a need' to expand upon Mintzberg's roles and
propositions (Stewart, 1982:11).

Her research indicated that managerial behavior could
vary at different levels, within levels, and in different

functions. One could expect to have difficulty in

validating Mintzberg's managerial roles if subject

populations were different (middle-level managers versus

executive, retail store managers versus Air Force

acquisition managers, etc.). This difficulty would increase

if the demands and constraints of their jobs also differed.

Stewart felt Fayol's management functions and Mintzberg's

managerial roles emphasized the common aspects of management

and were often 'too broad and ambiguous' (Stewart, 1982:8).

Stewart identified four work patterns into which she

classified management jobs. These work patterns include:

a. **Pattern 1:** Managers with fragmented activities
requiring frequent troubleshooting--Mintzberg and
Kotter's managers would appear to go here (Stewart,
1976:24).

b. **Pattern 2:** Managers with recurrent activities.
This work pattern is divided into two catetgories
depending on whether the recurrent activity is
anticipated or not (Stewart, 1976:24). A reactive
manager could fit here if the activity was not
anticipated. Mintzberg and Kotter's managers do
not fit here, however, because of their varied
activity patterns.

c. **Pattern 3:** Managers who work in sustained, long
time period, self-generated tasks (Stewart,
1976:24).

d. **Pattern 4:** Managers who have no primary work
patterns because they have large amounts of freedom
and choice (Stewart, 1976:24).

Stewart did identify pattern 1 (fragmented behavior) as the

most common managerial work pattern (Stewart, 1976:31). She

warned, however, that management education was preparing

students for jobs that had 'the time and opportunity to use

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analytical and strategic approaches`--she called this more
typical of the work in pattern 3 (Stewart, 1976:31).

Stewart also identified several types of job contact
such as hub, peer dependent, apex and solo. **The hub**, which
she called the `most common type of managerial job`, was
characterized by `radiating` contacts in all directions
within the managers realm of responsibility (Stewart,
1976:24). **Peer dependent** job contact was typical of staff
jobs where communication often occurred with people at the
same level (Stewart, 1976:24). **Apex job contact** was
characterized by frequent contacts with subordinates as well
as people outside the organization (Stewart, 1976:24). **Solo
job contact** would be typical of managers that have few
conversations or interactions with other people (Stewart,
1976:24). Stewart's research indicated that few managers
fit into the latter category.

Eventually, Stewart focused her research on whether
managers were reactive or proactive--specifically in terms
of their agenda. She stated that managers with `explicit`
agendas had clear ideas of where they wanted to go--they
were more proactive (Stewart, 1979:37). Her research
subjects, however, indicated a lack of clear agendas--the
majority practiced more reactive behavior (Stewart,
1979:37). These managers were typical of those in a
fragmented work pattern--and like the managers in

Mintzberg's study--were primarily responding to what was happening. There were exceptions. The most common, explicit agenda item among her sample of managers was the concern for developing relationships with peers, subordinates and contacts outside their organizations (Stewart, 1979:40). This effort to gain cooperation is a common theme in much of the literature.

Stewart also "speculated" as to whether proactive managers were more effective than reactive managers (Stewart, 1979:46). She noted in her study that "proactive managers seemed to get more done," but also stated that such a conclusion might also reflect "one's personal bias" (Stewart, 1979:46). There appears to be no clear answers to this question (for many, the answer might not even be important as long as the job gets done). It does seem reasonable, however, that well-designed management tools might free up some time for the manager. This free time--may in some instances--at least give the manager the choice of being reactive or proactive.

Fred Luthans. Luthans felt the real value of Mintzberg's work was his methodology of observing "real managers in real organizations" (Luthans and others, 1983:1). Luthans also noted that much of the previous research (including Mintzberg's and Kotter's) used small samples, focused primarily on executive-level managers and

did not analyze the effects of certain parameters on managerial success or effectiveness (Luthans and others, 1983:3).

Luthans and several others constructed a research design that included the use of direct observational methodology, large samples of managers, and "going beyond" the Mintzberg study by examining what successful managers really do (Luthans and others 1983:3). Luthans and several others gathered observational data from over 300 managers working in several levels (hierarchy), functions and organizations (Luthans, 1986:3). All of the observed management activities were eventually collapsed into four categories: routine communication (exchanging information), traditional management activities (Fayol's functions), human resource management (motivating co-workers and conflict resolution), and networking (politicking, interaction with outsiders) (Luthans, 1986:9). All four categories of activities were frequently observed. Some of Luthans' research results are presented pictorially in Figure 6. Luthans concluded that Fayol's traditional management functions were alive and well (unlike Mintzberg and Kotter); however, the significant amount of networking and human resource activities were not expected (Luthans, 1986:9).

With the large sample, Luthans was able to do some statistical analysis--specifically comparative, descriptive

DISTRIBUTION OF WORK ACTIVITIES
LUTHANS - 1986
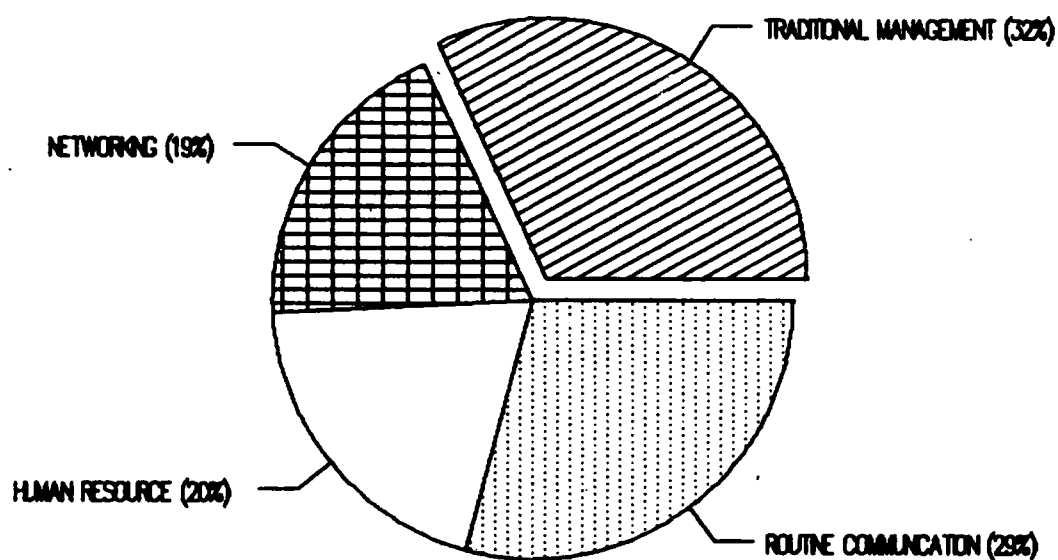
Figure 6.   Distribution of Work Activities
Luthans--1986

Data is from Luthans, 1986:9

analysis. Luthans pursued the question of whether effective managers (those producing good results) were also the successful ones (those getting promoted). He found that successful managers were observed doing more politicking and and a few more routine communication activities than less successful managers (Luthans, 1986:9). In contrast to successful managers, effective managers did little politicking; rather, they were observed doing more activities associated with conflict resolution and the motivation of co-workers (Luthans, 1986:10). These findings are thought-provoking as they indicate that successful managers are not always the effective ones. Moreover, these findings appear to indicate that effective managers are pursuing different agendas than the more successful managers. Luthans' analysis has 'far-reaching implications' not only for organizations (and their future performance), but also management education where the 'bottom line' has meant producing effective managers (Luthans, 1986:10).

Additional Research. An excellent summary of management work research (through the middle 70's) can be found in a Center for Creative Leadership report titled Studies of Managerial Work: Results and Methods (technical report #9). McCall, Morrison and Hannan only selected studies that used 'direct methods' of data collection--primarily observation and diary (McCall and others, 1978:2). Based on this criteria, they selected well

over 20 studies for analysis including the research of Carlson (1951), Burns (1954 and 1957) Guest (1956), Maples (1968), Mintzberg (1970) and Stewart (1976). Their review of these studies resulted in the identification of ten managerial characteristics that were 'generally supported' by most of the studies (McCall and others, 1978:36). Table I lists the ten managerial work characteristics. In general, the characteristics in Table I are consistent with the findings of Mintzberg and Kotter and may explain why the two researchers felt confident in making some bold claims (despite their small samples). Mintzberg and Kotter referenced many of these same studies to support their own conclusions.

McCall and others also point out some 'unanswered questions' in all of the reviewed studies--most notably--if managers were able to control their work and whether effective managers did things differently than less effective managers (McCall and others, 1978:19-20). The previously discussed work of Stewart and Luthans are attempts to fill this void.

The unrelenting pace that Mintzberg and several others describe as being typical of the manager's workday may be a reason for the lack of observed traditional management activities (i.e., planning, organizing and commanding). Another reason might be that the observer does not

Table I

Common Managerial Work Characteristics *

1. Managers work long days.

2. Managers are busy.

3. A manager's work is often fragmented--episodes are brief.

4. A manager's job is varied.

5. Managers spend a lot of time within their own organizations.

6. The manager's work is primarily oral.

7. Managers use a lot of contacts.

8. Managers are not reflective planners.

9. Information is the basic ingredient of managerial work.

10. Managers are not aware of how they spend their time.

*Compiled from McCall and others, 1978:6-18

acknowledge an activity as being typical of a traditional management function. As previously mentioned, Mintzberg suggested that planning was not a managerial role; rather, such a function was a 'vague' objective and not an 'integral' part of their jobs (Snyder and Glueck, 1980:70). Since this is at odds with several studies (especially the management process researchers), some efforts have been made to resolve this conflict (Snyder and Glueck, 1980:70-71).

Snyder and Glueck felt Mintzberg's structured observational methodology failed to address why managers were doing various activities (Snyder and Glueck, 1980:75). They partially replicated Mintzberg's observational methodology with two executive-level managers and found a great deal of time devoted to planning. Glueck and Synder reasoned that Mintzberg failed to relate activities to purpose (Snyder and Glueck, 1980:75). Further, they noted many planning activities were 'cognitive' in nature; and therefore, not subject to structured observation without some type of follow-up interview technique (Snyder and Glueck, 1980:75). The hectic pace, typlified by brief contacts with a wide variety of people, did not mean that managers were not continually trying to plan for and control the future of their organizations (Carroll and Gillen, 1987:43). Snyder and Glueck conclude that managers do plan and that in some abstract sense, it may play 'a mixed part

of every managerial act or function" (Snyder and Glueck, 1980:75).

Mahoney, Terdee and Carroll also conducted research that indicated it was possible to relate observed activities to the more traditional management functions. They had managers explain why they were accomplishing each activity by asking research subjects to fill out a questionnaire describing what they were doing (Carroll and Gillen, 1987:41). Tables II and III summarize their research and show the proportion of time managers spent accomplishing various work activities (Table II) and the more abstract management functions (Table III). The management functions represented in Table III are an "expanded" version of Fayol's five--the set of eight are often called the "PRINCESS factors" (Carroll and Gillen, 1987:40). Table II points out the dominance of speaking, writing and reading (almost 80% of the work time) in the manager's workday--this is consistent with previously discussed literature. It also indicates that the manager spends a relatively small amount of time pursuing analytical activities. Table III indicates the most common management functions exhibited by the managers were investigating, coordinating and planning. Table III would appear to contradict Mintzberg's view that planning is not an integral part of the manager's work.

Table II

Observed Management Work Activities *

Work Activity	Proportion of total work time
===============	===============
Conversing with others	41
Preparing & writing reports, letters, etc.	19
Reading & reviewing reports, letters, etc.	18
Operating equipment	05
Minor clerical (filing, sorting, etc.)	05
Personal activities	05
Thinking & reflection	03
Walking & travel	02
Inspecting products, procedures, etc.	01
Mathematical computation	01

	100%

Table III

Observed Management Functions *

Management Function	Proportion of total work time
===============	===============
Investigating	26
Coordinating	21
Planning	19
Supervising	12
Evaluating	08
Negotiating	07
Staffing	05
Representing	02

	100%

*Tables II and III adapted from Carroll and Gillen, 1987:41

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Tables II and III also point out an interesting
contradiction with traditional thought. Despite the small
percentage (3%) of activities associated with thinking and
reflection, managers were still doing a considerable amount
of planning (19%). Moreover, Tables II and III appear to
suggest that planning most likely takes place in the
linguistic domain. This is somewhat consistent with Snyder
and Glueck's comment that planning may be a part of every
managerial activity. It is also consistent with McCall's
research finding (review Table I again) that managers are
usually not reflective planners. Another observation is
that planning without reflection better fits Mintzberg's
adaptive planning model--it reflects a continuous if not
real-time planning scenario. As such, it may also indicate
a dominance of tactical planning, but little or no strategic
planning. To summarize, its seems premature to rule out the
relevance of Fayol's management functions in describing
management work. A better question, however, is whether the
activities associated with these functions fit the
traditional mold? The answer to this latter question may in
great part explain why Mintzberg, Kotter and Stewart have
such great difficulty with Fayol's traditional management
functions.

Summary. In management research, it is possible to
reach two or more different conclusions (theories) with the
same set of data. Such is the complexity of human behavior

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and the research thereof. It is also possible that what constituted planning activities in 1927 is no longer still the case; however, this does not mean the planning function is no longer relevant. Whether you subscribe to Fayol's managerial functions or Mintzberg's managerial roles (or both), it is difficult to ignore the dominance of linguistic activities in managerial work. Oral conversation and the written word rise to the top when describing management work.

A good understanding of managerial activity levels (a somewhat lower level of abstraction than managerial roles or functions) is a must for the designer of management tools. The observational studies of Mintzberg, Kotter, Stewart, Luthans and several others have 'shed light' on this activity level by focusing on more 'concrete, observable' activities; and as such, favor 'empirical reality' as opposed to abstract concepts (Davis and Luthans, 1980:68-69). The designer must not only be concerned with whether or not the manager plans and controls, but also whether planning and controlling are accomplished with speech acts or mathematical calculations.

The following passage from Brewer and Tomlinson (1964) best completes this section:

> The manager controls a highly complex system from which emanates a mixture of noise and signals. First he has to distinguish signals from noise. Secondly he has to ascribe an order of priority to the signals received

without being sure that he has received all signals. Furthermore, the signals are frequently inadequately processed. In other words he has to decide, on inadequate data, which refer to transient phenomena and which to long-term trends. He has few, if any, closed loops. In such a situation it is to be expected that a manager's daily behavior will exhibit an erratic pattern and that it will be concerned so largely with a verbal process aimed at the obtaining and systematizing of information [Brewer and Tomlinson, 1964: 197].

Other Aspects of Managerial Activities

Management activity research has motivated several additional studies. Much of this additional work has focused on the fragmented nature of observed managerial behavior and the communicative relationships that exist. This section includes further discussion on the role of natural language in managerial work, the characteristics of the manager's network of cooperation, and the concept of the adaptive manager.

The Role of Natural Language. Daft and Wiginton theorize that natural language may "be much more powerful than mathematical language" in understanding and explaining managerial behavior (Daft and Wiginton, 1979:179-191). They make the following observations:

a. Managers are not reflective, but rather, lean toward live, face-to-face contact (Daft and Wiginton, 1979:179).

b. Management Science/Operations Research techniques are having little effect on organizations despite increased training (Daft and Wiginton, 1979:179). They note that even the most recently schooled graduates are not using analytical techniques and tools (Daft and Wiginton, 1979:180).

c.   Management education (primarily quantitative and
     analytically based) does not seem to help managers
     beyond certain points in their career--"non-MBAs
     were often more successful" at the 15-year point
     (Daft and Wiginton, 1979:179). This view is
     supported by the research of Ward and Marshall who
     found "no direct relationship between performance
     in school or training programs and records of
     success in management" (Livingston, 1971:79-81).

d.   There is some doubt in the value of doing
     statistical studies of large organizations.
     Rather, some researchers "urged a strategy of
     getting into small, everyday organizations" and
     trying to explain observed relationships (Daft and
     Wiginton, 1979:180).

e.   Managers are not capable of handling the cognitive
     load many are faced with. This leads to the
     concept of bounded rationality--managers have
     limits on their abilities to process information
     (Daft and Wiginton, 1979: 180).

f.   In many cases, managers face "ambiguous" and
     "ill-structured" problems--even open system models
     fail to capture the human side of these problems
     (like shared meaning, awareness and emotion)
     (Daft and Wiginton, 1979:80).

Daft and Wiginton felt that there was something central to
these observations. They went on to propose that in
language--"a system of spoken or written symbols that can
communicate ideas, emotions, and experience"--some
understanding might lie (Daft and Wiginton, 1979:180-181).
They proposed a continuum of languages and postulated that
certain languages were situationally more appropriate (if
not required) than others. Figure 7 shows this continuum
and indicates that some languages are better for
communicating complex ideas and emotions (better for
high-variety and ambiguous situations) while other languages
are better suited for more precise and narrow communications

```
HIGH VARIETY                  Art & Music
(AMBIGUOUS)
                              Body Language

        ↗ NONVERBAL
                              Poetry

                              General Verbal
                              Expression

        → NATURAL            Jargon
          LANGUAGE
                              Computer
                              Language

          SPECIAL           Probability
          PURPOSE           Theory
        ↗ LANGUAGE
                              Analytical
                              Mathematics

LOW VARIETY
(PRECISE)
```
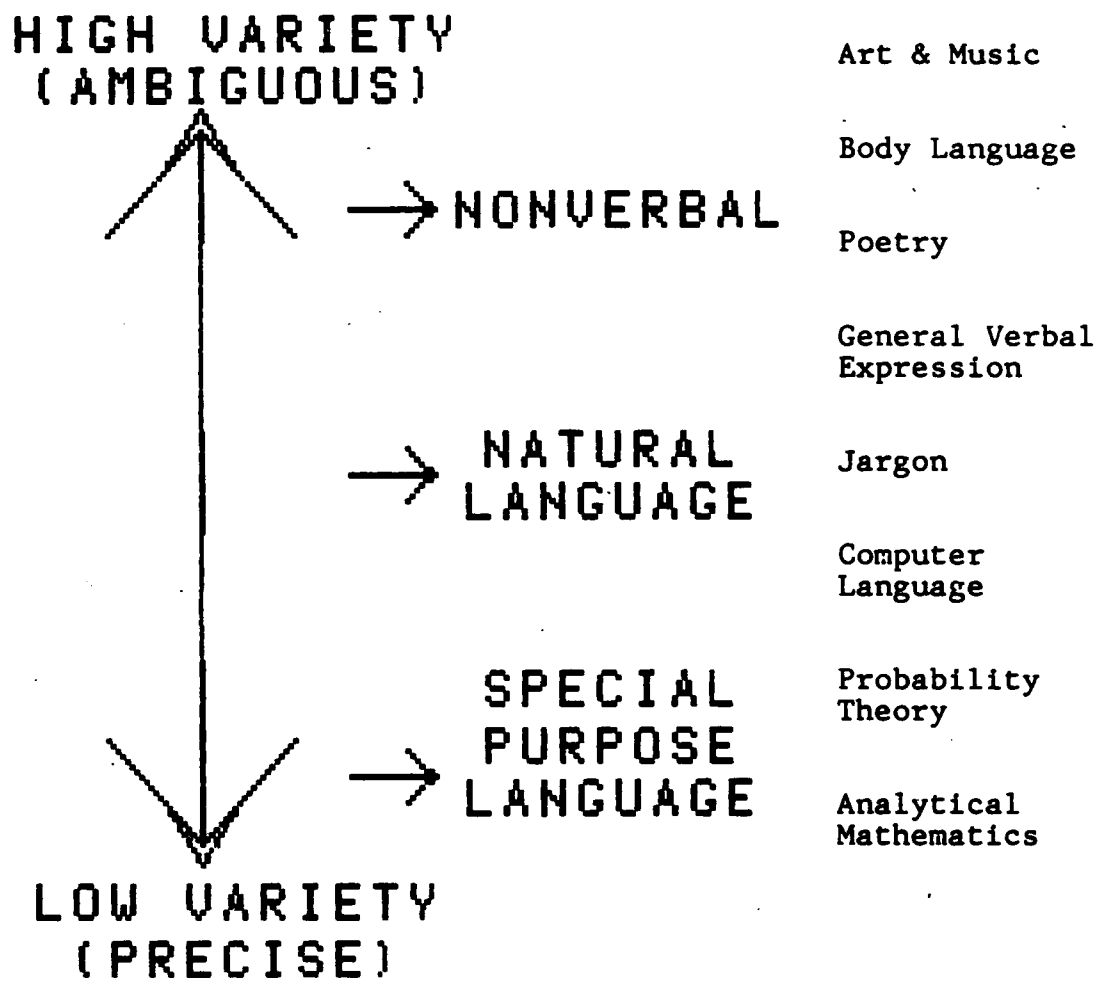
Figure 7.   Continuum of Languages

Adapted from Daft and Wiginton, 1979:181

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(low variety situations). The emphasis in natural language
activities (like face-to-face conversation) in managerial
work was consistent with the complex and ambiguous
situations many managers faced. Figure 7 also helps explain
the lack of observed mathematical activities in the
manager's workday (review Table II on page 46 again). Daft
and Wiginton reasoned that managers were obeying Asby's Law
of Requisite Variety by using rich languages (like
face-to-face conversation) to match the variety of their
task environment (Daft and Wiginton, 1979:182).

The manager's need to verbally communicate and exchange
information is driven by their need to reduce uncertainty
(Daft and Lengel, 1986:567). This uncertainty is often
increased for senior managers who are frequently shielded
from bad news (Peters, 1979:165). Admiral William Crowe,
Chairman of Joint Chiefs of Staff, has said 'an operation is
always mounted with imperfect intelligence--you never know
everything you should' (Carrington, 1988:14). Given the
concept of bounded rationality and the need to reduce
uncertainty, it is not surprising to find that most managers
prefer 'qualitative, face-to-face' conversations (Daft and
Lengel, 1986:160). Face-to-face conversation is capable of
transmitting meaning, interpretation and commitment--it
cannot be viewed as just an exchange of information
(Winograd and Flores, 1986:176). Figure 8 shows a range of
media available to most managers. The media in
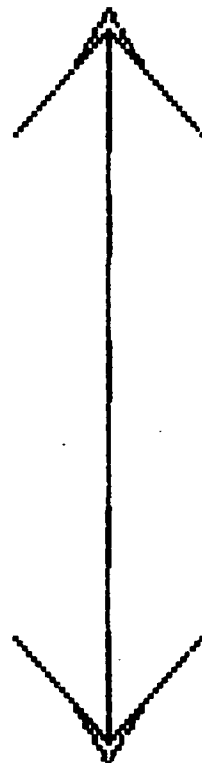
```
INCREASING                    Unstructured,
MEDIA RICHNESS                Non-Routine Tasks


        ▲
       /│\
      / │ \      ──────▶ •   Face-to-face
         │                   Conversation


         │        ──────▶ •   Telephone


         │        ──────▶ •   Personal Letters &
                              Memos


         │        ──────▶ •   Impersonal Written
                              Documents


      \  │  /     ──────▶ •   Numerical Documents
       \ │ /
        \│/
         ▼

DECREASING                    Precise, Routine
MEDIA RICHNESS                Tasks
```

Figure 8. Continuum of Media

Adapted from Daft and Lengel, 1986:560

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Figure 8 are arranged in order of decreasing richness
(ability to communicate and change one's understanding).
Face-to-face conversation is the 'richest' medium
as it provides 'immediate feedback' plus 'multiple cues'
such as body language and voice tone (Daft and Lengel,
1986:560). Some of the more 'hidden messages managers send'
(like body language and office arrangement) can go a long
way in decreasing the ambiguity of a situation--and
thus--help carry the message and its meaning to the receiver
(McCaskey, 1979:135).

Lengel's doctoral research indicated that managers were
aware of the need to match media richness with the
communication needs of the situation (Lengel, 1983:84).
Managers who faced uncertain and ambiguous situations
required a rich media (like face-to-face conversation) to
help convey understanding, gain commitment and reduce
uncertainty. Lengel also identified other variables that
appeared to offer additional explanation for the richness
match concept. These variables included the position of
the manager in the organizational hierarchy, organizational
culture, individual personalities, and whether the manager
was a sender or a receiver in the communication process
(Lengel, 1983:84). Lengel's data, however, exhibited what
he called a 'convergence phenomena' (Lengel, 1983:87). For
tasks that required rich communications to change opinions
or resolve conflict--the need to use rich medias dominated

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the 'secondary effects' of organizational culture,
personality and work position within the hierarchy (Lengel,
1983:88). The common observation of managers engaged in
face-to-face conversation or using other rich media was
indicative of individuals who were adapting and continually
trying to learn about an uncertain environment. Daft and
Lengel point out that

> When the environment is uncertain and equivocal, rich
> media are called for...once differences are resolved
> and agreement is reached, less rich forms of
> communication, such as memos and formal reports, will
> be sufficient for coordination [Daft and Lengel,
> 1986:224].

Pondy and Mitroff also viewed organizations as
'language-using, sense-making cultures' (Pondy and Mitroff,
1979:30). Management's function--working within Boulding's
eighth level of complexity--was to help the organization
understand its present course as well as its basis for
future action. Pondy and Mitroff felt this shifted the
manager's role from 'technologist to linguist' and provided
'radical implications' for management education (Pondy and
Mitroff, 1979:30). They suggested the statistical and
quantitative nature of management education be balanced with
language-oriented curriculum such as poetry (Pondy and
Mitroff, 1979:30).

Perhaps a natural reason for the dominance of verbal
conversation in managerial work is that much of management
is mental (Carroll and Gillen, 1987:43). Daft and Wiginton

point out that high-variety, rich language (like verbal conversation) 'is coextensive with human thinking' (Daft and Wiginton, 1979:183-184). They go on to say that 'verbal language fits the mind since it is a creation of the mind'--the natural link results because it is the human mind that manages our organizations (Daft and Wiginton, 1979:184).

In summary, face-to-face conversation enhances the manager's capability to handle complex and subjective situations. The common observation of natural language activities (speaking, reading and writing) associated with managerial work can in part be explained by the need of the manager to match an appropriate language to the task environment.

Networks of Cooperation. Much has already been said about networking (see previous discussion under Kotter and Luthans) and the importance it plays in the manager's working day. This section provides additional detail on the important concepts that influence these networks of relationships.

Robert Kaplan writes that the manager's network 'may be his or her most valuable asset' and that it is very much a 'reciprocating set of relationships' (Kaplan, 1984:37). Kaplan notes that this network extends both vertically and laterally--but most managers spend their time 'outside the vertical channel' (Kaplan, 1984:38). The following are

some key points that Kaplan brings out about this network of help:

   a.   The network is reciprocating--favors are often
        returned for information (Kaplan, 1984: 40-41).

   b.   'Self-serving' behavior can 'backfire'--a manager's
        'connections' often strengthen by his or her
        ability to 'invest in other people's agendas'
        (Kaplan, 1984:42).

   c.   Good communication skills are important, but you
        must also know when to use other skills such as
        one's diplomatic ability (Kaplan, 1984: 45).

The manager's 'personal character' is ultimately the key to
maintaining, fostering and being allowed to participate in
this network of cooperation--he or she must be sincere and
willing to share information (Fox and Morrison, 1985:1).
This implies that managerial success may be limited if one
becomes 'self-centered' or 'overly competitive' (Fox and
Morrison, 1985:7).

    Ann Morrison writes that the 'units of exchange' in
this network of cooperation are information, services,
support and access (Morrison, 1984:3). She notes that
information is the most valuable commodity and the challenge
is not simply to develop contacts--but to develop 'useful'
contacts and then put them to work (Morrison, 1984:1-5).
This emphasis on information and sharing ideas brings us
back to the central role that language plays in the
managerial communication process. It is through language
that managers share ideas, control perceptions, define
meaning, and command organizational influence (Pondy and

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Mitroff, 1979:24). Morrison concludes that **networks are very useful management tools; but unfortunately, the required skills are rarely taught** (Morrison, 1984:5).

Networks of help are evident most everywhere you find managers, including the military. Admiral William Crowe, has been called 'well tapped in' due to his 'formidable' information network (Carrington, 1987:14). His network of help--developed over time while assigned all over the world --keeps him well informed regardless of whether he is part of the 'inner workings' (Carrington, 1988:14).

Having access to the inner workings often implies that you have the benefit of sensitive information. Sensitive communications are typical of the information flow in an informal network (Fox and Morrison, 1985:8). Having access to an informal network--and the sensitive communications therein--allows managers to explain 'candidly' why something is required (Fox and Morrison, 1985:8). Informal networks can give managers access to rich media of exchange.

In summary, managers can improve their effectiveness and potential success by being part of a network of cooperation. Kaplan observes that networks 'figure prominently' at all levels of managerial work (Kaplan, 1984:52). For middle-level managers, it may take the form of the hub-like networks described by Stewart (Kaplan, 1984:52). Executive level managers--like Admiral Crowe--

may use Stewart's `apex-type` network that reaches down into the organization and `laterally into the outside world` (Kaplan, 1984:52).

The Adaptive Manager.   Much of the previous discussion portrays the manager as reactive rather than proactive and fragmented as opposed to organized.   The literature also indicates that managers work at a high activity level and thrive on oral communication.   This active environment often forces managers to spend most of their time `fighting fires` and not coming `upon critical issues until late in the game` (Peters, 1979:165). Mintzberg concluded from his research that managers were `adaptive information manipulators in an environment of stimulus response` (Davis and Luthans, 1980:65).   Mintzberg also noted that managers accepted this environment because they did not want to interrupt the flow of current information (Peters, 1979:166).   `Current, inside` information is a must for managers in a complex and uncertain environment--it gives them the best chance of acting before an event occurs (Morrison, 1984:3).

Given an environment where there is not enough time, the time available is often interrupted, and most of the issues that confront the manager contain a great deal of uncertainty, some researchers have asked how the manager can become more effective.   Davis and Luthans express managerial

behavior along the continuum presented in Table IV. Table
IV introduces a behavioral pattern not previously discussed
in this review--that of adaptive behavior. The descriptors
that go with adaptive behavior define 'a hybrid of the two
extremes' (Davis and Luthans, 1980:70). The directional
goals that characterize adaptive managers would appear to
describe Kotter's managers who pursued agendas and
Mintzberg's managers who exercised leadership despite hectic
daily schedules. These adaptive managers continually
control, coordinate and plan (they are forced to because
even the best-laid plans continually abort) by means of
frequent conversations via their informal networks (Fox and
Morrison, 1985:1).

The significance of this discussion is that labeling
managers as totally reactive may misrepresent the central
direction and essence of their work. Table IV indicates
adaptive managers have directional goals. This type of
behavior is evident in much of the previous discussion
(including Mintzberg's managers). The hectic and fragmented
nature of the manager's working day may just as easily be
discussed in terms of the manager continually adapting to a
changing environment. Davis and Luthans point out that
adaptive or directional behavior 'may ultimately prove
to be the most appropriate base from which to develop
meaningful models of managerial behavior' (Davis and
Luthans, 1980:70).

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Table IV

Continuum of Managerial Behavior *

Proactive	Adaptive	Reactive
Clear goals	Directional goals	No predetermined goals
Defined patterns of behavior	Patterns determined interactively in actual setting	Reaction to immediate stimulus
Cognitively based	Cognitively and noncognitively based	Noncognitively based
Models include: expectancy motivation & path-goal leadership	Mintzberg's planning model	Need Theory of Motivation i.e stimulus-response conditioning

* Adapted from Davis and Luthans, 1980:70

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Davis and Luthans also propose forms of managerial self-control along the continuum defined in Table IV. They call this form of control 'behavioral self-management' and conclude that 'there is a strong case' that managerial self-control may be an 'important missing link' to increased work effectiveness (Davis and Luthans, 1979:60).

Flores and Winograd

Fernando Flores and Terry Winograd are not management researchers. They are, however, individuals concerned with the design of tools to help the manager--and as such--their interpretation of management is critical. Flores is a practicing manager. He is founder and chairman of a company devoted to the design of tools (specifically software) that facilitate human work (Kerr, 1987:118). Flores also has government experience having served as a cabinet member in Chile during the 70's. Winograd, a computer science professor at Stanford, has contributed considerable research and study towards the pursuits of artificial intelligence. He is also the president of Computer Professionals for Social Responsibility. Together, these two individuals form an intellectually powerful combination.

The major theme from their book, Understanding Computers and Cognition, is that computers should not be thought of as a substitute for human intelligence, but rather, a complement (Schrage, 1987:17). Their book focuses

on an understanding of the central role of language in human work. They apply this understanding to the subject of how tools might best be designed to facilitate human work. Specifically, their book focuses on how computers might facilitate such work. This section reviews their thoughts on management, the conversations managers take part in, and tools that can facilitate management work.

Their Management Philosophy. Flores and Winograd believe describing managers as individuals who control information, people and assets misses 'the central commitment' of their work (Flores and Bell, 1984:180). Rather, they believe that managers 'are paid to discover what is missing' from their work, and then 'bring that into being' (Flores and Bell, 1984:180). Managers are paid to to bring this work forward by whatever means are available--as such--managers should not be confused with administrators 'who follow certain procedures mechanistically' (Odiorne, 1975:14).

Flores and Winograd believe this concern for future action takes place primarily in the linguistic domain (Winograd and Flores, 1986:144). This belief is supported by the research and writings of Mintzberg, Kotter, Daft, Pondy, McCall and most all individuals who have observed actual managerial work. Managers who best articulate shared meaning and understanding within their networks of help have

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the best chance of achieving group consensus on required

actions (Pfeffer, 1981:21). This group consensus and

subsequent collective action drives management work to a

successful completion. The effectiveness of managers to

work in this linguistic domain is a function their

capabilities to

a. Engage in effective conversations about future work
(Flores and Bell, 1984:180).

b. 'Make and deliver' on important commitments towards
future actions and events (Flores and Bell, 1984:
180).

c. 'Make and get fulfilled' important commitments to
superiors and peers for resources, action and
support (Flores and Bell, 1984:152).

Winograd and Flores view this work as occurring inside

networks of help--cooperative links where personal

relationships and speech acts facilitate the successful

completion of work (Winograd and Flores, 1986:144).

Managers must secure commitment by actively working their

network. They must also the manage the breakdowns that

occur within these networks (breakdowns are a guaranteed

part of managerial life). The following passage describes

such the scenario:

A manager's superior requests a specified action by a
specified time. Either immediately, or after some
negotiations, the manager commits to the action and
time. Then the manager divides up the total job and
parcels it out to subordinates, requesting (and
ultimately getting) commitments from each of them. The
manager monitors progress of the subordinates. If
things go astray, commitments may have to be
renegotiated [Spotlight, 1986:6].

Winograd and Flores point out that 'competent' work within this network 'does not mean correct grammatical usage or diction, but successful dealing with the world, good managerial abilities and responsibility and care for others' (Winograd and Flores, 1986:162). The manager's communicative competence is a function of his or her capacity to 'express one's intentions' and take an active responsibility in making and fulfilling commitments within the network (Winograd and Flores, 1986:162). This competence goes beyond just being able to exchange information. Flores and Winograd highlight the importance of communicative competence and conclude

> ...there exists a domain for education in communicative competence: the fundamental relationships between language and successful action. People's conscious knowledge of their participation in the network of commitment can be reinforced and developed, improving their capacity to act in the domain of language [Winograd and Flores, 1986:162].

Conversations for Action. Flores and Winograd view human society as operating primarily 'through the expression of requests and promises' (Winograd and Flores, 1986:176). Recognizing the hectic, fast-paced world of managerial life and the need to bring work forward, Flores and Winograd identify conversations for action as the primary linguistic domain of the manager. Conversations for action are characterized by the interplay of speech acts directed at getting something done--the mental processes are geared

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towards requesting or offering cooperative action (Winograd and Flores, 1986:64).

Typical speech acts that can be labeled as conversations for action include: requests (for information, action or services), promises, offers, acceptances, counteroffers, rejections, withdrawals, acknowledgements, reneging or declaring actions as complete (Winograd and Flores, 1986:65). A review of Mintzberg's research suggests these types of speech acts occur frequently in both oral and written forms (Mintzberg, 1973:32). These conversations facilitate the making and fulfillment of commitments. They also contain a 'bias toward action'--a work attitude that is very much a part of successfully completing management work (Spotlight, 1986:1-2). These conversations also seem well-matched to the management environment as the following passage suggests:

> In an office environment, everything gets done via language. New orders are received and processed. Requests for information are received. Customers are notified when merchandise is shipped. Each such transaction is constructed in language. And each can be considered to be a conversation [Spotlight, 1986:1].

The challenge for the designer of management tools becomes one of trying to facilitate these conversations (and other types as well). Can conversations for action be meaningfully represented and facilitated by other than face-to-face conversation? Flores and Winograd conclude that 'computer-based tools can be used in requesting,

creating, and monitoring commitments' (Winograd and Flores, 1986:158). Such a tool must be designed to facilitate the linguistic capabilities of managers so they can successfully ask for and receive commitment within their networks of cooperation (Flores and Bell, 1984:182). Flores and Winograd propose the design structure of such a tool be based on fundamental speech acts found in the conversation for action--the request, promise, offer, acceptance, status (interim or final) and the acknowledgement (Winograd and Flores, 1986:159).

Possible Management Tools. Until recently, computer applications (and office automation in general) have focused on increasing the productivity of the individual (Winograd and Flores, 1986:158; Spotlight, 1986:16). Examples include word processing, spreadsheets, data base management products, graphics packages, statistical programs and generally all computer-based decision support systems and expert systems. Many of these tools, however, 'ignore the collective dimension of human work' (Flores and Winograd, 1986:158). Previous discussion indicates managerial work deals with this collective dimension--managers need to converse with other people. Networks of cooperation and the central role they play in facilitating commitment are visible products of this collective dimension. Previous discussion also highlighted

the central role of natural language in furthering management work.

It is not surprising that the moment managers exercise their linguistic capabilities, the computer often "ceases to exist" (Flores and Bell, 1984:181). In these instances, the manager often reaches for the telephone, walks down the hall to talk to a peer, or perhaps gets on a plane and flies several thousand miles for a face-to-face meeting. Such is the nature of management work.

Flores and Winograd feel computers can play a more significant role in facilitating the collective nature of the manager's linguistic work. They promote another type of computer-based tool--one designed and based on facilitating management conversation (Winograd and Flores, 1986:157). With the advent of telecommunications, some designers are focusing on "work group productivity systems"--tools that mix the capabilities of electronic mail, some type of calendar management system (helpful in tracking commitment completion and breakdown), word processing, and a structural design that facilitates conversational acts (Spotlight, 1986:1). These computer-based tools--when applied to the manager's network, work group, committee or project team--better match the need to support the collective dimension of management work (Spotlight, 1986:16).

Flores' company has already designed, developed and marketed a computer-based tool that facilitates the speech acts in a conversation for action (and other types as well). The system stores conversations as "entities" so that all speech acts regarding a specified subject can be reviewed from beginning to end (Spotlight, 1986:2). This allows the manager to review the background leading up to the successful completion or breakdown of a commitment. This concept of background is important to understand. Flores and Winograd point out that conversations for action are "linked in patterns"--an offer usually precedes the acceptance (Winograd and Flores, 1986:168). These patterns can lead to the successful completion of work or indicate potential breakdown. A single message sent via electronic mail can be ambiguous without benefit of this background (Flores and Bell, 1984:183). Work group tools designed to facilitate speech acts and account for background exceed what is commonly understood and expected of an electronic mail system (Flores and Bell, 1984:183). When a powerful word processor and a well-designed calendar management system are added, a very capable networking tool evolves.

A government report reviewing the feasibility of Flores' tool concludes that significant benefits are attainable in the structured communications of their managers, program integration, cost savings from fewer meetings (less travel), reduced postal expense, and

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increased work group productivity (Pacific, 1986:1-1 to 1-5). This thesis was produced with the word processor designed as a part of Flores' work group productivity tool. Many of the commitments leading up to the successful completion of this thesis and other classwork were tracked and facilitated with the same system.

One immediate challenge that these networking tools must face is whether they will be able to facilitate meaningful speech acts. At present, such tools will not have benefit of the visual cues (body language, a smile, voice tone, etc.) that help the sender convey meaning and the receiver interpret messages (Spotlight, 1986:11). If adequate media richness cannot be achieved, managerial usage of such tools may be lower than desired. These challenges should not be viewed with discouragement, because there is already considerable evidence that the written word can convey variety and richness--witness the ability of poetry to convey meaning. Also, advances in technology are already on the verge of reducing this challenge by combining the power of the computer with video and audio equipment (Richman, 1987:136). This type of technology will not only allow network members to see one another as they converse, it will also allow immediate review and exchange of memos, contract letters, reports and graphical data (Richman, 1987:136).

When this first challenge is met, the next obstacle will be getting managers to use the tools. Previous discussion indicates that several managers (especially executive-level) are short on time, but long on daily agenda items. Further, many managers are not proficient typers (Ecung, 1983:9). Today's computers, however, are primarily keyboard oriented (Ecung, 1983:9). Given a fast-paced and varied workday, plus some of the obstacles discussed above, it remains likely that some managers will still opt for the quick telephone call, or wait for the chance to converse face-to-face, perhaps even forego the coordination and/or communication process altogether (especially if the urgency is great).

A Need for Balance. Previous discussion paints a picture of a manager who works hard to get through a fragmented and busy day dominated by conversations for action. Stewart tempers this picture by indicating that not all managers behave alike--some have different demands, constraints and choices. Indeed, Mahoney, Jerdee and Carroll's study (review Table II on page 46 again) show a moderate proportion of time (20%) devoted to other than natural language activities (Carroll and Gillen, 1987:42). Mintzberg's research also shows managerial time devoted to activities such as strategy (13%) and ceremony (12%) (Mintzberg, 1973:32).

Flores and Winograd address this more balanced picture
of managerial work by identifying another domain of speech
acts. This new conversational domain is called
conversations for possibilities. Conversations for
possibilities are characterized by speech acts where people
share ideas and propose future actions (Coordinator,
1987:163). A good analogy is thinking before doing--this
is the type of conversation that `shapes your actions`
(Coordinator, 1987:163). The traditional management
function that best fits conversations for possibilities is
planning--specifically strategic planning. Many reflective
activities associated with decision-making can also be
discussed within this conversational domain. When a manager
takes part in a conversation for possibilities, it indicates
a behavior pattern when he or she is taking time to think
and reflect. These are not time periods where you put
your strategy or plan into action. To the contrary, this
time period is characterized by questions such as `Where am
I headed now` or `Is this where I wanted to be headed`
(Coordinator, 1987:163). In comparison, conversations for
action are characterized by the attitude that you are
`headed wherever you are headed`, and typically, managers
want to get there as fast as they can (Coordinator,
1986:163).

Tools that best support conversations for possibilities
include group networking software (again) and decision

support systems. Decision support systems 'suggest alternatives, predict consequences', and combine other information that might go into making a decision or picking some planning alternative (Winograd and Flores, 1986:152). Not all conversations for possibilities can be aided by decision support systems. Situations that are uncertain, 'emergent', and unstructured often call for new ideas--more typical of Herbert Simon's unprogrammed decision (Winograd and Flores, 1986:153). A computer-based decision support systems (or expert system), however, only allows the user to explore a 'preconstrained' set of alternatives (Winograd and Flores, 1986:152). There is a certain amount of blindness in these tools. If the programmer or analyst forgets or does not fully understand the constraints (or for many real world problems--the lack of constraints) of a managerial situation, the computer may provide quick answers that are of little value (Mahaffay, 1975:499). Unstructured problems take advantage of this blindness, often forcing the manager back into the conversational domain. Regardless, there is a domain of circumstances for which decision support systems and expert systems can help the manager. The question is how often this domain occurs?

Flores and Winograd recognize the potential of decision support systems and expert systems, but they also state that such tools do not represent 'the most promising domain in which to build computer tools for managing' (Winograd and

Flores, 1986:157). For this reason, Flores and Winograd deliberately avoid labeling managers as decision-makers. They are concerned that such a label will misrepresent the real essence of managerial work (Winograd and Flores, 1986:144). Previous discussion supports this concern. Mintzberg's research indicates managers are not reflective and systematic (Mintzberg, 1975:50). Kotter's research indicates actual managerial behavior is less reflective and more reactive (Kotter, 1982:156). Stewart identifies the fragmented behavior of pattern 1 as the most common managerial work pattern (Stewart, 1976:31). McCall, Morrison and Hannan, after completing a review of over 20 studies dealing with the direct observation of managers, conclude managers are not reflective planners and their work is primarily oral (McCall and others, 1978:12-15). Mahoney, Jerdee and Carroll's results indicate that reflective work activities take up less than three percent (3%) of the manager's time (Carroll and Gillen 1987:41). Further, they go on to provide evidence (see Table III) that planning is still occurring--perhaps in the conversation for action domain. Parnell and Triscari did not find a single user of expert systems and few users of computer-based decision support systems at an Air Force product division (Parnell and Triscari, 1987:6). All this leads one away from labeling the manager--in a traditional sense--as a reflective decision-maker.

What is reflected in the majority of literature
dealing with observed managerial behavior is the need on the
part of the manager to converse with other people. The
role of natural language is central to this communication
need. Flores and Winograd have apparently arrived at this
understanding. The tools they promote and are designing
facilitate the domain of conversational speech acts.

Summary. Flores and Winograd believe that
management `conveys the sense of active concern for action`
with the goal of attaining commitment and cooperative action
within the manager's network of help (Winograd and Flores,
1986:151). This concern for action is played out primarily
in the linguistic domain. As such, Flores and Winograd are
designing tools that facilitate group communication.
Specifically, they are designing tools that facilitate
conversations for action and conversations for
possibilities. These work group tools focus on the
collective productivity of the group--not the individual.
This understanding of the manager's needs appears consistent
with the views of researchers who have observed actual
managerial work.

It is interesting to think about the potential success
of computer-based tools designed to facilitate managerial
conversation. If such tools are successful, not only will
managerial communication be enhanced, but time might also be

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freed up for other activities. In other words, enhancing
and organizing the manager's capability to converse (already
a dominant activity) might also open up more time for
reflective activities. This is an important concept to
understand since great communication does not necessarily
forecast outstanding managerial performance (Hawkins and
Preston, 1981:2). Good ideas are required as well--and good
ideas fit nicely into conversations for possibility or
reflective domain. For those that have used Flores' new
tool, some of this reflective thought is already evident in
the design. The capability of Flores' software to present
the background (past conversations) to the manager before he
or she commits to further conversation enhances one's
capability to understand where they have come; thus, a
conceptual basis is established for the future action that
is required (note this essentially is the same reason a
literature review is part of the thesis). For organizations
where there are frequent changeovers in managers (like the
military), this capability to retrieve and then reflect upon
past conversations can be even more important.

Chapter Summary.

The purpose of this summary is to solidify a conceptual
understanding of managerial work--then take a look ahead and
hypothesize what one might expect of middle-level managers
in the Air Force acquisition environment. The previous
discussion has not espoused a new managerial work theory or

model. Abstract management theories, functions, and models exhibit behavior patterns quite similar to athletic records--the moment one is proposed, it is destined to be broken. There also seems to be enough management theory, one more adds unneeded complexity. Rather, the focus of this summary will remain on observed managerial activity patterns documented in the literature.

The majority of the literature highlights the central role of natural language in managerial work--specifically action-oriented conversation. Some managerial work also exhibits reflective and analytical qualities, but the time spent on these activities does not match that of action-oriented conversation. Several studies indicate that managers are very busy, are often interrupted, and appear reactive rather than proactive. This is not a generalization for all managers, as some will have different demands, constraints and choices. Managers that do appear more reactive often work in a complex and uncertain environment. This uncertainty drives them towards the use of high-variety and rich communication media such as face-to-face conversation. Many of these managers are not in the total sense reactive. Rather, many retain direction-oriented goals and adapt to the many disturbances they face.

The primary tools many of these managers use are the
people that support them--their networks of help. The
speech acts and conversations for action that occur within
these networks are critical to the making and fulfilling of
commitments that lead to the successful completion their
work. Tools can be designed to facilitate this work. These
tools can be simple ones such as a pencil or a telephone, or
more complex ones like a computer-based group networking
system. All of these tools can and will be used if they
can facilitate meaningful speech acts. Tools can also be
designed to facilitate the conversations and activities
associated with the manager's more reflective and analytical
moments. These tools include those discussed above and
decision support systems.

Our attention must now shift to managers in the Air
Force--specifically middle-level managers supporting the
acquisition of the service's hardware. The acquisition
environment represents but one set of demands, constraints
and choices that managers can face in the Air Force--there
are also several other managerial career fields.
Acquisition managers, however, do control a great deal of
the money that is spent in each fiscal year. Further, they
work on programs that are often in the nation's spotlight.
General Lawrence Skantz, the former Commander of Air Force
Systems Command, notes that

Acquisition programs account for almost 45 percent of
the total Department of Defense budget. In the Air
Force, while many support the effort, fewer than 2 per
cent of our people are directly involved in contracting
and program management. **So the return on investment
for the skills represented out there is very, very
important** [Skantz, 1984:2].

Specific to the Air Force, acquisition activities

(procurement, test, research and development, etc.) account

for about 60% of the service budget (Skantz, 1984:2). The

next few paragraphs hypothesize, based on the conceptual

understanding developed, what the nature of this important

work might be.

There is considerable evidence of very challenging and

complex managerial work in the acquisition environment.

There is also evidence of significant uncertainty. This

uncertainty ranges from unstable program funding supporting

tight, high-risk schedules to the consistent changeover of

key personnel (Baumgartner and others, 1984:31-38). This

uncertainty is amplified by the complexity of the task--the

timely and successful development of sophisticated,

high-tech weapon systems. Paschall concludes that

"**management of major weapon system acquisitions is complex**

and depends on and is influenced by a number of factors,

mostly related to the people involved in the program"

(Paschall, 1977:21). These people include congressmen,

operational users, logistic support personnel, contractors,

taxpayers and those directly responsible for developing,

testing, and acquiring the system. All of these people have

different demands, constraints and choices. With such complexity, one can postulate that high-variety languages will play a major role in this environment.

The focus of this research will be on middle-level managers who are directly involved in the development, test and acquisition of Air Force weapon systems. Weapon System Program Directors are dependent to a great extent on their own abilities and the competence of their people (Paschall, 1977:1). The System Program Director's people are typical of middle-level managers in small to middle-sized companies (Paschall, 1977:1). In the Air Force acquisition world, these small-sized companies are called System Program Offices (SPO). A great number of these people work in Air Force Systems Command (AFSC). While most of these middle-level managers work in SPOs and within AFSC, Air Force acquisition is also supported by other agencies and commands. In some instances, several of these players are not under the direct control of the weapon system program manager. Regardless, all of these middle-level managers must in some manner come together to support the needs of the program.

These middle-level managers appear situated in much the same manner as the hub-like positions described by Stewart. They stand between their organization (the acquiring or support agency) and the environment (the contractors, users,

and public at large). The responsibility and complexity of
their jobs, while not as global as the Weapon System Program
Director, is still great. Their needs to converse with
other people also appear to be extensive. Tools that
facilitate such conversation would appear to satisfy their
fundamental needs.

III. Methodology

The purpose of this chapter is to outline, discuss and describe the research design. By the end of this chapter, readers should have a clear understanding of what they will see in Chapter IV (results). This chapter begins with a general description of the research design. This description lays the foundation required for understanding the proposed methodology. More detailed sections follow that describe the sampling plan, survey instrument, and strengths of the research design. Next, the research hypotheses and investigative questions are presented. The research hypotheses are correlated with a data-gathering method and test statistic. The test statistic was used by the investigator to help judge the acceptance or rejection of the research hypotheses. A description of the analysis techniques, test statistic and presentation format follow the discussion of the research hypotheses. A general summary concludes the chapter.

Research Design

General Approach. As stated in the introduction, the purpose of this research was to better understand the primary activities of Air Force acquisition management work and the tools required to facilitate this work. The literature review formed a conceptual understanding from

which this research focus can be pursued. In addition, the literature provided the basis from which a research design can be proposed and hypotheses postulated for subsequent testing. The research design and hypotheses proposed in this chapter were conceptually based on an understanding of the management themes discussed in <u>Understanding Computers and Cognition</u> and the research and writings of Mintzberg, Kotter, Daft and several others who have observed and studied actual managerial activities. The major theme reflected in this understanding is the dominance of human conversation as the cornerstone of management work. All the research hypotheses and most of the investigative questions are stated in a manner that reflect this theme. This research will test the applicability of these hypotheses to Air Force middle-level acquisition managers.

The methodology for this research was motivated by Daft and Wiginton's views about need for more qualitative managerial research. Daft and Wiginton recognized that a great deal of organizational research was designed to analyze and model human behavior in precise and quantitative terms (Daft and Wiginton, 1978:185). They warned that this might be a "mistake" since researchers were be trying to apply an unambiguous, precise measurement and analysis methodologies (<u>i.e.</u>, precise languages) into very complex, ambiguous organizational settings (Daft and Wiginton, 1979:185-187). An example (expressed in terms previously

discussed under Boulding's system levels of complexity) is
the conduct of level 1 or 2 research in an environment
characterized by level 8 complexity. A good analogy would
be comparing the manager's need to use rich, high-variety,
less-precise natural languages in a complex and ambiguous
work environment to the researcher's need to match
qualitative, less-precise research designs to complex,
ambiguous organizational settings.

Daft and Wiginton postulate that 'the disparity between
research and reality' might be due to language and note the
preciseness of mathematical and some statistical languages
may contain too little variety for organizational research
(Daft and Wiginton, 1979:185-186). These concerns point to
the possibility that more ambiguous, qualitative, natural
language-based research designs may be more applicable to
organizational research. McCall, Morrison and Hannan
support this view with their observation that most
managerial research designs use data reduction methods (they
cite factor analysis as an example) that form a
'constricting paradigm' on the rich variety of the manager's
work (McCall and ohters, 1978:33). They go on to say that

> Based on input which is already deficient in the rich
> variety of details which make up the actual content of
> managerial behavior, certain statistical methods
> distort the picture even more as they raise the data to
> yet another, higher level of abstraction. As a result,
> our knowledge of managerial behavior is at once very
> limited and overgeneralized [McCall and others,
> 1978:33].

In the spirit of this thinking, the methodology for this research was based on the following approach:

a. There was a greater focus on general, qualitative managerial work patterns versus specific, precise patterns. All the research hypotheses were addressed by gathering ordinal-scaled data showing the relative position or rank of variables such as managerial resources, common work activities, conversation types and usage of tools.

b. The survey instrument--a questionnaire--was designed to emphasize the use of natural language to convey questions and obtain respondent answers. In some cases, research subjects were asked to verbally explain the rationale for their answers. In only a few cases were managers asked to quantify their activities--and even then--only in an average sense.

c. Nominal and ordinal-scaled data was favored versus interval or ratio. The less-precise measurement procedures were deemed a better match for the the complex and ambiguous managerial environment.

d. Analysis techniques included plotting simple distributions (pie charts) and the use of some nonparametric statistics. Nonparametric statistics have 'a broad range of applicability' and can better match the high-variety that exists in managerial work (Gibbons, 1976:26). Parametric methods were considered too precise and restricting for the complex and ambiguous managerial environmenet.

In summary, qualitative and less-precise research designs have qualities that can make them more appropriate for organizational research (Daft and Wiginton, 1979:189). Most managerial research is focused on the behavior of individuals or groups that are working within Boulding's 8th system level of complexity (social organizations). Just as there is constant need on the part of the manager to match language and media richness to the work situation, also

must the researcher match a methodology to the variety of the organizational setting. Natural languages, nominal and ordinal-scaled data, and nonparametric statistics are appropriate for ambiguous and high-variety situations. In cybernetic terms, this research methodology attempts to match the variety of organizational setting (Asby's law of requisite variety--only variety absorbs variety). This implies the use of a more qualitative, descriptive and less-precise methodology. The next few sections describe the sampling plan, survey instrument, and strengths of the research design.

Sampling Plan. Who is a middle-level manager in the Air Force acquisition environment? One of the unique aspects of working in Air Force acquisition is the level of responsibility you are handed the first day you step into the office. It is not unusual for newly assigned officers fresh out of college to be given management responsibilities comparable to 30 or 40 year old middle-level managers in the commercial sector. For definition purposes, this research considered Air Force officers and civilians with a minimum of two years of acquisition experience as middle-level managers. There was no attempt to sample at military ranks of Colonel or higher, or civil service grades of GM-15 or higher. These positions of responsibility were considered to be more typical of senior or executive-level managers in the commercial sector.

Middle-level Air Force acquisition managers come to the
Air Force Institute of Technology (AFIT) for much of their
professional continuing education (courses in Systems
Acquisition Management, Test and Evaluation Management,
Advanced Acquisition Management, etc.). This presents the
opportunity to survey managers currently working in
acquisition related jobs while they are on campus. Further,
the survey process does not take time away from their jobs
nor is it affected by the pressures of their jobs. This
provides a reasonable probability the survey instrument will
be filled out (won't be thrown away) and the manager will
have time to reflect on the responses.

Three AFIT professional education classes were chosen
for sampling. These classes were:

    a.   System Acqusition Management Class (Systems 200):
        composed primarily of company grade officers (Capts
        and Lts) and civilians (GS-11s and 12s).

    b.   Advanced Systems Acquisition Management (Systems
        400): composed primarily of field grade officers
        (Majs and Lt Cols) and civilians (GS-13s and 14s).

    c.   Test and Evaluation Management (Systems 229):
        composed primarily of company grade officers,
        field grade officers and civilians.

In addition, a second System 200 class was used to pre-test
and finalize the questionnaire.

There was no attempt to take a random sample. The data
gathering methodology described above is based on
convenience and is better categorized as non-probability

sampling. These three classes, however, provided a mixture of Air Force officers and civilians working in various acquisition related jobs at locations throughout the country. In general, most of these managers worked in Air Force Systems Command--the primary acquiring organization within the Air Force. In addition, most of these individuals worked in System Program Offices (SPO) or supported SPO work through some type of matrix or support agency (lab or test) work relationship. As a group, these classes contained individuals who were representative of those working in middle-level acquisition management positions within the Air Force.

In all cases, the questionnaire was passed out at the beginning of the second week of each class. A 30-45 minute briefing introduced the questionnaire to the research subjects. The more difficult and complex parts of the survey were explained and questions were answered. The research subjects were given three days to complete the survey. The average return rate for each class was around 80%. Over 120 questionnaires were filled out. An even 100 subjects were chosen for evaluation. This number was chosen for simplicity of purpose and presentation (percentages could be easily translated into whole values by the reader). Criteria for questionnaire acceptance included:

a. A direct involvement in managing acquisition or a
    process that supported acquisition (like test,
    program control, logistics, or engineering).

b. An indication of at least two years experience in
    Air Force acquisition.

The sampling plan supported the objectives of this
research. The 100 subjects chosen for analysis represented
a mixture of officers and civilians supporting several
different acquisition programs. The group was composed of a
mixture of military ranks and civil service grades, males
and females, different organizations, job positions and
locations. The demographics, job locations, job
responsibilities and educational backgrounds of the 100
research subjects are presented in the first part of Chapter
IV.

Survey Instrument. A questionnaire was used to
survey the three classes. This questionnaire is attached in
Appendix A. In general, the questionnaire takes 30-45
minutes to complete (51 questions) and contains a mixture of
questions that call for rank-ordering, selecting answers
from a number of responses, and short written responses.
The questionnaire was organized in three parts: demographics
and individual background, work environment, and work
characteristics. The questionnaire was designed to obtain
background information on the research subject, get a
feeling for the environment the research subject worked in,
and then have the research subject describe how he or she

worked in this environment. The results (Chapter IV) are presented in a similar order.

The demographics section asked for information regarding experience, job titles, and responsibility. In addition, this section also asked for information regarding job location and the individual's self-perceived educational skills. This section was used to select the 100 research subjects.

The work environment section was designed to gather information on the subject's placement within the home organization and some characteristics of their work environment. This section attempted to measure the complexity of their work by asking each manager to estimate the average number of daily contacts and issues that made up their work. This section also questioned the subject regarding the availability of specific tools (computer, electronic mail, etc.) in their office environment.

The final section was designed to gather descriptive information on the subject's management work activities and the primary tools facilitating his or her work. This section contained the bulk of the questions, many of which required the subject to rank-order work activities and tool usage. In some instances, the managers were also asked to explain the rationales for their top-ranked choices.

In most instances, the questionnaire asked for nominal and ordinal-scaled responses from the manager; as such, it reflected the desired research approach of describing qualitative managerial activity patterns. In combination, the three sections of the questionnaire provided the capability to qualitatively assess the primary nature of Air Force acquisition management work and the tools required to facilitate this work.

The following are a few words of warning. First, this questionnaire was not designed to gather precise, quantitative time estimates from the manager. It is not recommended that this questionnaire, without benefit of direct observation, be used to accurately quantify the time managers spend on daily activities. Researchers who have used multiple method research designs (questionnaire and direct observation) have found that managers consistently overestimate the time they spend reading, writing, reflecting and calculating (McCall and others, 1978:17). They also frequently underestimate the time spent in meetings or informal discussions (McCall and others, 1978:17). Secondly, the length of time it takes to fill out the questionnaire and the number of questions that require rank-ordering of variables (more strenuous thinking) may make this questionnaire unsuitable as a mail-out survey for managers who already have a busy work schedule. The high

return rate (80%) for this questionnaire should be judged in terms of its placement in the total research design.

In summary, the questionnaire emphasizes the use of natural language to ask questions--and in several instances--calls for natural language responses from the subject. The questionnaire asked for reflection and effort upon the part of the subject. The sampling plan provided the appropriate time and environment for this thought to take place. This questionnaire was administered locally. In addition, difficult portions of the survey were introduced and verbally explained (face-to-face) to the research subjects. The subjects were given several days to reflect on the questions.

Strengths of Research Design. The strengths of the research design are discussed relative to what would be considered an optimum (time-permitting) methodology for investigating managerial work. First, the optimum approach is described. Next, the strengths of this research approach are discussed (relative to the optimum), followed by a presentation of measures taken to minimize the weaknesses.

The literature indicates that multiple method research designs are most appropriate for the study of actual managerial activities. Such a research design would use a questionnaire to gain a qualitative understanding of managerial work, some type of direct or structured

observation technique to quantitatively assess actual behavior, and some follow-on face-to-face interviews to help explain and get at the root of the observed behavior. All this takes a considerable amount of time, training and planning--and as such--may be out of scope for most master's degree students.

Structured observation does provide a more concrete picture of what managers actually do (Davis and Luthans, 1980:69). Mintzberg promoted methodologies based on structured observation because he felt managers were too busy to fill out questionnaires or keep accurate diaries (Mintzberg, 1970:104). A criticism of structured observation, however, is that it may fail to capture why managers are doing specific activities. This criticism points to the need for some type of follow-on interview or questionnaire to dig into the background of why a manager is doing something (Snyder and Glueck, 1980:75). Indeed, Carroll and Taylor point out that the manager's physical activities may not be reflective of his or her mental picture (Carroll and Taylor, 1968:359-364). Carroll and Gillen note that the brain 'works continuously' and that it most likely continues to work long after 'quitting time' (Carroll and Gillen, 1987:43).

The questionnaire has been used to evaluate what managers were thinking and why they are doing certain

activities (Carroll and Gillen, 1987:42). There are few instances, however, where the questionnaire has been successfully used to quantitatively assess the time managers spend accomplishing daily work activities. The quantitative evaluations, should they be desired, better fit in the domain of structured observation.

A final note is that training may be required for observers prior to their participation in research calling for direct observation. Stewart noted that 'uninitiated' observers can have a difficult time understanding what is occurring and then coding it correctly (Mintzberg, 1970:100-101). Luthans put his observers through an 'extensive' training program prior to their participation in his research effort (Luthans and others, 1983:7). Training takes additional time and manpower; as such, it can lengthen the research process and add to the planning complexity.

This research made use of a questionnaire to pursue a qualitative understanding of the research focus. The following are strengths of the research design:

a.   The methodology, as qualitatively designed, was appropriate for the variety of the subject area and research purpose. The research was designed in consideration of Asby's Law of Requisite Variety.

b.   The questionnaire was administered in a face-to-face manner to the research subjects. This permitted the opportunity to clarify portions of the survey and answer questions. This strength was designed into the study in consideration of

matching a communication medium of appropriate richness to the task.

c. The research subjects were given several days to complete the questionnaire without the distractions and pressures of the work environment. This consideration was designed into the research to account for the questionnaire's length and strenuous questions.

d. The resulting return rate on the questionnaire was reasonably high (80%).

e. The research design was manageable given the time allowed for planning, questionnaire formulation, data gathering, analysis and report preparation.

The following are some potential weaknesses of the research design and measures taken to minimize these weaknesses:

a. Some managers may have 'constrained' abilities to recall their work activities and behavior patterns (McCall and others, 1978:31). To minimize this potential loss in their recall abilities, the subjects were surveyed early in the second week of their class. In addition, managers were asked in most cases to recall activities measured on nominal and ordinal-scales, not the more precise interval or ratio scales.

b. Some of the subjects may try to 'censor' some of their responses to 'show themselves in good light' (McCall and others. 1978:31). In an effort to lower the probability of this type of behavior occurring, the briefing that introduced the questionnaire to each class stressed that there were no right answers and the importance of accurately reflecting their practice of management. In addition, the subject's name, specific job title and program identification were not required.

Research Hypotheses

The primary theme consistently highlighted in the review of literature was the dominance of managerial activities associated with the facilitation of natural

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language (speaking, meetings, conversations on the phone,
etc.). Several research questions were postulated regarding
the same role for natural language in the Air Force
acquisition environment. These research questions were
translated into hypotheses that could be tested against the
sample of 100 middle-level managers. These research
hypotheses were proposed and submitted to a nonparametric
test to further aid the investigator in reaching some
research conclusion (Gibbons, 1976:14).

Since the purpose of this research was to investigate
the nature of Air Force acquisition management work,
hypotheses were generated to study the existence of some
agreement or association among the managers as to the
primary activities and tools being used to facilitate this
work. Managers were asked to rank-order several variables
(like primary work activities and tool usage) on an
ordinal-scale so the research hypotheses could be addressed.
The generic null hypothesis was that there was no agreement
or association. For example, if the rank-ordered variables
exhibited little or no relationship or association to one
another, they would be considered independent. The
alternate hypothesis was that there was some association or
agreement on the ranking of the variables.

The following is a list of the null hypotheses for this
study:

a. There is no agreement as to the most important resources of the Air Force middle-level acquisition managers.

b. There is no agreement as to the primary activities of the Air Force middle-level acquisition managers.

c. There is no agreement as to the primary managerial conversation types of Air Force middle-level acquisition managers.

d. There is no agreement as to the preferred communication media of Air Force middle-level acquisition managers.

e. There is no agreement among middle-level Air Force acquisition managers as to the top tools in terms of usage and importance.

f. There is no agreement among Air Force middle-level managers as to the top applications and uses of the computer.

Table V presents the list of alternate research hypotheses correlated with the data gathering technique (usually the manager was required to rank-order variables such as primary activities and tool usage) and the test statistic. If the null hypotheses could be statistically rejected in favor of the alternate hypotheses, this would imply that the conceptual understanding, established in the literature review, could be used help explain and understand the work activities of Air Force middle-level acquisition managers. The words, Work Environment and Work Characteristics (enclosed in parentheses in Table V), indicate the section in which each hypothesis is addressed in Chapter IV. The test statistic, the Kendall Coefficient of concordance, is

Table V

Alternate Research Hypotheses

Hypothesis	Data-Gathering Method	Test Statistic
===========	===========	===========
1) People and information are the most important resources of the manager (Work Environment).	Managers rank-order resources	Kendall coefficient of concordance
2) Activities that facilitate natural language are the most the most common work activities of the manager (Work Characteristics).	Managers rank-order primary work activities	same
3) Managers take part in more conversations for action than conversations for possibilities (Work Characteristics).	Managers rank-order conversation types	same
4) Managers prefer rich, informal communication medias versus precise, formal medias (Work Characteristics).	Managers rank-order different types of media	same
5) Devices that facilitate natural language activities are the top tools in terms of usage and importance to the manager (Work Characteristics).	Managers rank-order importance and usage of tools	same
6) The top computer applications in terms of managerial usage are those that facilitate natural language (Work Characteristics).	Managers rank-order usage of computer applications	same

discussed in more detail in the next section (Data Analysis and Presentation).

In addition to the null hypotheses listed above and the alternate research hypotheses presented in Table V, several additional investigative questions were asked to help address the research focus. The following is a list of additional questions that were addressed in this research:

a. What percentage of the managers have computers and electronic mail readily available for use (Work Environment)?

b. What is the complexity level of the manager's job measured in terms of the number of different issues and people they must deal with on a daily basis (Work Environment)?

c. On the average, how much time did managers spend at work each day? How much time was spent working at home (Work Characteristics)?

d. On the average, how much time did the managers spend working by themselves in the office (Work Characteristics)?

e. How many times a day do managers use computers (Work Characteristics)?

Pie charts, frequency histograms and simple tables (listing proportions in percentage format) were used to pictorially analyze and present the data addressing these questions. The analysis techniques and data presentation formats are discussed in more detail in the next section.

Data Analysis and Presentation

Nominal Data. Since much of the data gathered in this study was nominal in scale, pie charts were often used

to represent the frequency distribution of the data. Frequency histograms and polygons were not considered appropriate for presenting nominal-scaled data because such categories have no logical order for presentation (as compared to numerical data) (Kachigan, 1986:40). The pie charts were arranged such that variables were presented from most frequently occurring to least frequently occurring. In several cases, simple tables were used to present the same type of relationship. The first part of Chapter IV presents the background and demograghics of the research subjects primarily by means of pie charts and simple tables listing variable proportions. When opportunities arose to deal with more quantitative variables, histograms and bar charts were used to analyze and present the data.

Ordinal Data. All of the research hypotheses were addressed by asking the research subjects to rank-order primary managerial activities, conversation types, and tool usage. The use of data measured on an ordinal-scale satisfies one of the criteria (you only need to satisfy one) for the use of nonparametric statistics (Gibbons, 1976:23). In addition, this analysis did not require specific population distribution assumptions (non-probability sampling) nor were any inferences made concerning population parameters. The 'distribution free' nature of nonparametric statistics provides great variety in terms of potential applications (Gibbons, 1976:22). This great variety is also

what makes nonparametric statistics a great match for complex, ambiguous, high-variety organizational research.

Of primary interest was whether there was some association or agreement among the 100 research subjects relative to primary activities and tools. A simple way to discuss this is to think of the 100 research subjects as judges and the various activities, resources and tools as beauty contestants (Gibbons, 1976:301-310). The question is whether the judges have some agreement on the winners of the beauty contest? This type of technique falls under the statistical category called association analysis. A nonparametric, descriptive measure called the Kendall coefficient of concordance can be used as a test statistic to make inferences about the existence of some agreement (association) between the group of judges (our research subjects) as to the winners among the beauty contestants (managerial activities and tools).

The Kendall coefficient of concordance can be used as a test statistic with a chi-square distribution and n-1 degrees of freedom (Gibbons, 1976:306). P-values can be calculated based on the value of the test statistic. Since the p-value represents the probability distribution under the null hypothesis, it can be used to make statistical decisions as whether to reject or accept the null hypothesis (Gibbons, 1976:11). If the p-value is small, the researcher

can state that the data does not support the null hypothesis
and then make a statistical decision to reject it. For
purposes of this research, a stringent value of 0.001 was
selected as the cutoff for rejection of the null hypothesis
(p-values greater than 0.001 will not allow us to reject the
null hypothesis of no association).

The Kendall coefficient of concordance can vary from 0
to 1 where 1 would represent perfect association. If the
coefficient is less than 1, but large enough that the
P-value is very small (in our case less than .001), the null
hypothesis that there is no association is still rejected
(Gibbons, 1976:307). In such cases, the investigator can
conclude that there is a consensus of agreement as to the
ranking of the variables (small p-value), but there is also
evidence of sampling variation (Kendall coefficient less
than 1). This nonparametric test was used several times
during the analysis of the data. Each research hypothesis
(and other rank-order relationships as well) will be
summarized in table form in Chapter IV. The table will
include the rank-ordered list of variables (as determined by
the managers), the average ranking, the Kendall coefficient
of concordance and P-value.

Chapter Summary

The methodology for this research was designed with the
objective of producing a qualitative assessment of Air Force

acquisition management work. The qualitative approach was motivated by the need to match a high-variety and less-precise research design to a complex and ambiguous organizational setting. The focus of this research was the Air Force middle-level manager. A questionnaire was designed and used to survey a group of 100 Air Force middle-level managers while they were at AFIT attending professional continuing education classes. Both Air Force civil service employees and military officers were sampled. Several research hypotheses were postulated based on the conceptual understanding developed in Chapter II. Simple analysis techniques (pie charts and frequency histograms) and some nonparametric statistics were used to evaluate the data, test the hypotheses, and present the results.

The research results will be presented in the same order that the questionnaire was designed. First, the demographics and background of the research subjects will be presented. Next, their job environment will be described. The final sections will describe the primary work activities of Air Force middle-level managers and the tools being used to facilitate their work activities.

IV. Results

The purpose of this chapter is to present the analysis and results of the managerial work survey given to 100 Air Force middle-level acquisition managers. Chapter IV will be presented in the following order:

a. First, some demographics, job information, and educational background are presented for the 100 research subjects.

b. Next, the characteristics of acquisition management work environment are described. This section qualitatively describes the managers' environment, assesses the potential complexity of their work, evaluates resources that make up this environment, and lists tools available to help managers accomplish their work.

c. The final two sections present the work characteristics of the 100 acquisition managers and the tools being used to facilitate this work. These sections represent the bulk of the research results and consist primarily of managerial activities and tools that have been rank-ordered in terms of the role they play in the successful completion of acquisition management work.

Chapter IV is presented in an order that facilitates a gradually increasing understanding of Air Force acquisition managers, their environment, and work. Appendices B through E are designed to complement this understanding--and as such--are frequently referenced during the course of discussion. These appendices list recorded verbal responses the research subjects provided as rationale for their answers. The appendices are short, easy to scan, and

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designed to supplement the managerial understanding presented in this chapter.

Demographics and Background

This section describes some personal characteristics of the 100 research subjects. First, some basic demographics (sex, age, etc.) are presented. Next, the managers' job locations and positions are described. Finally, the managers' educational backgrounds and self-appraised skill strengths are presented.

Demographics. Despite the growing numbers of women in the Air force, and the increased responsibilities they are taking on, the majority of job positions and work activities are still filled and accomplished by males. This is reflected by the fact that 89% of the research subjects were male. The ages of 100 managers were evenly spread from 23 years old to those who were in their late 40's. This age group distribution is presented in Figure 9. The respective proportions of military and civilian managers were 75% (all Air Force officers) and 25% (civil service). Figures 10 and 11 show the distributions of military ranks and civilian grades. In general, most of the Air Force officers were first lieutenants, captains, and majors. The majority of civilians were GS-12s, 13s, or GM-13s. Overall, the demographics of the 100 research subjects are reflective

Distribution of Ages
YEARS (PROPORTIONS)
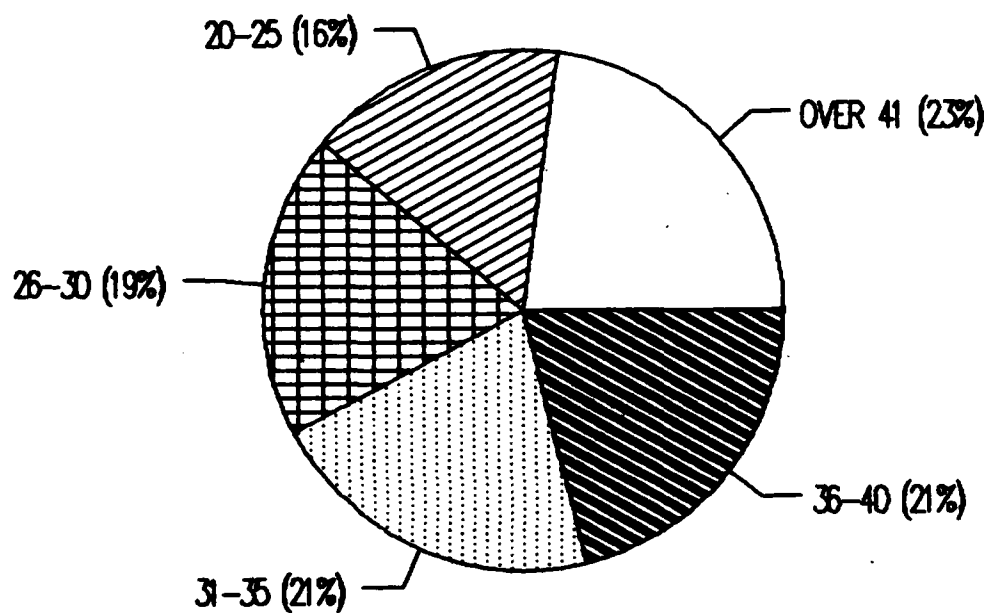
Figure 9. Distribution of Ages

Distribution of Military Ranks
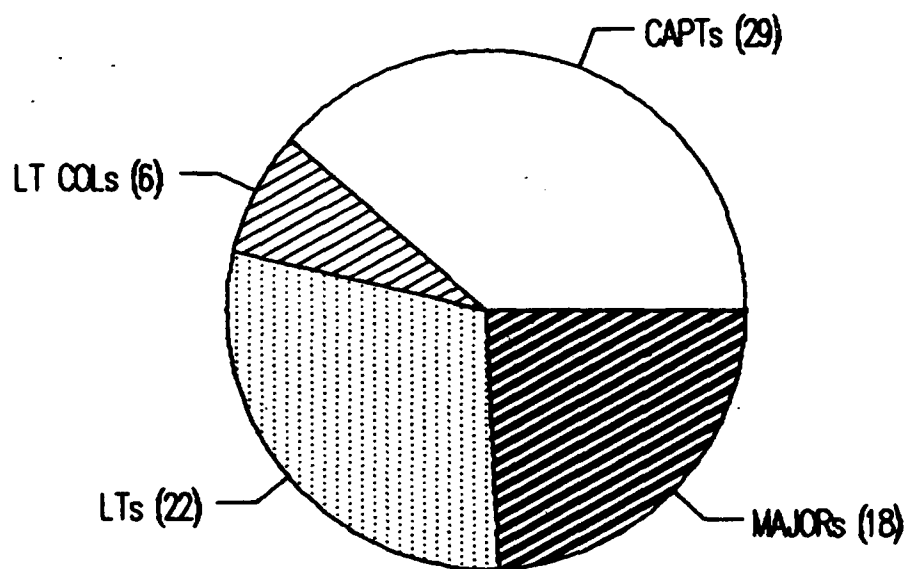
Figure 10.   Distribution of Military Ranks

Distribution of
Civilian Grades
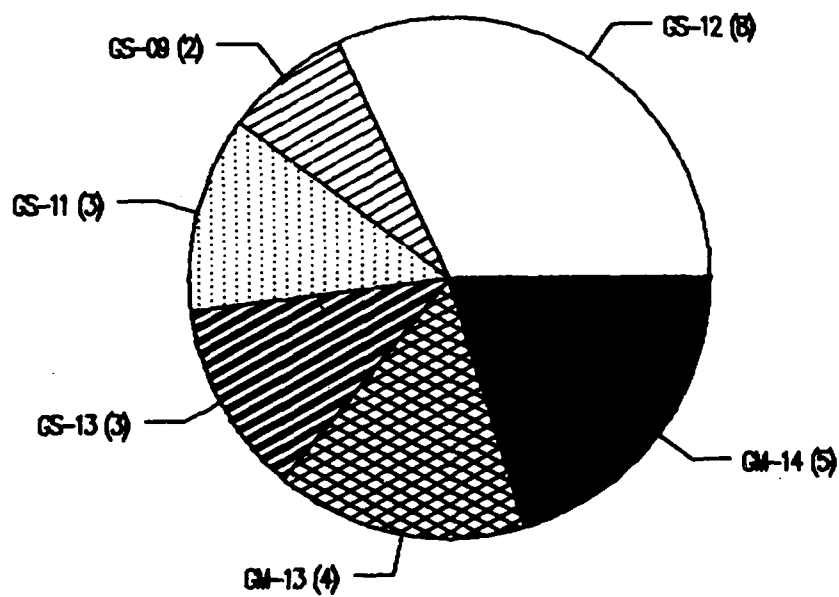
Figure 11.   Distribution of Civilian Grades

of the men and women presently working middle-level management jobs in Air Force acquisition.

Job Location and Organizational Position. This section presents the job locations and organizational positions of the 100 research subjects. Not unexpectedly, the majority of the research subjects (91%) worked in Air Force Systems Command (AFSC). AFSC's primary mission is the successful accomplishment of major weapon system design, development, procurement and implementation. Table VI shows the distribution of managers by command. Table VII presents the distribution of Systems Command organizations that are represented in this study. All of the managers fell into one of five types of programs ranging from aeronautics to space systems. The distribution of these programs is presented in Table VIII. Within AFSC, the majority of the managers surveyed were from Aeronautical Systems Division (ASD). ASD is the largest product division in AFSC both in terms of the number of people it employs and the budget it commands. Individuals from the other four AFSC product divisions--Space Division, Ballistic Missile Office, Armament Division and Electronic Systems Division--were also represented.

A large number (44%) of managers indicated they had supervisory responsibilities in addition to their acquisition duties. These managers identified themselves as

Table VI

Major Command Distribution

Major Command	Proportion of Total Sample
=============	==========================
Systems Command	91
Logistics Command	5
Communications Command	2
Electronic Security Command	2
	=====
	100%

Table VII

Systems Command Organizational Distribution

Organization	Proportion of Total
============	===================
Aeronautical Systems Division	59
Ballistic Missile Office	9
Electronic Systems Division	8
Armament Division	7
Space Division	3
Other (test facilities & labs)	14
	=====
	100%

Table VIII

Acquisition Program Distribution

Acquisition Program	Proportion of Total Sample
===================	==========================
Aeronautics	65
Communications	16
Ballistic Missiles	8
Armament	6
Space	5
	=====
	100%

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directors, division or branch chiefs. The remainder of the
research subjects identified themselves as project managers.
The median experience level for these managers was 3-5
years. Eighty-five percent (85%) of the research subjects
indicated they had anywhere from 2 to 10 years of
acquisition experience. The remaining 15% had over 11 years
of acquisition experience.

Sixty-five percent (65%) of the research sample
indicated they were directly assigned to System Program
Offices. These individuals worked directly for the weapon
system program manager. The remainder of the sample
included functional support managers who were supporting the
System Program Office via some type of matrix management
scheme, and individuals from test or engineering development
organizations (like the Air Force Flight Test Center and
Arnold Engineering Development Center) who were supporting
an acquisition program.

Educational Background and Skills. The Air Force
is continually raising the standards of what is expected
from their people in terms of educational background. In
addition, the Air Force is attracting high-quality and
well-educated people. Many of these people are working in
Air Force acquisition. This was most evident by the fact
that 54 of the 100 research subjects had obtained a master's
degree. The remainder of the managers (46) were either

college graduates or individuals who had completed doctoral studies. These managers were also asked to rank-order the strength of their job skills based on their educational background, training and work experience. Table IX shows the distribution of educational degrees among the research subjects. Table X shows the rank-order of their job skills. Working with people (interpersonal skills) and working with numbers (quantitative skills like math and engineering) were generally ranked higher than speaking, business and computer skills.

The small p-value in Table X indicates that the rank-order is significant and allows us reject the null hypothesis of no association in favor of the alternate hypothesis that there is some consensus as to the stronger and weaker skills among this group of managers. The coefficient of concordance indicates the existence of significant sampling variation. This variation is in part due to variety of academic talents these managers have and the difficulty in rank-ordering seven skill categories.

All the skill categories were top-ranked a minimum of five or more times. In general, the managers with the least amount of experience (typically younger as well) ranked their quantitative skills higher than their interpersonal skills. The more experienced managers, however, generally ranked interpersonal skills higher than their quantitative

Table IX

Distribution of Educational Degrees

Educational Degree	Proportion of Total Sample
==================	==========================
Master's	54
4-year College	45
Doctorate	1
	=====
	100%

Table X

Rank-order of Job Skills

Rank	Skill	Average Ranking
======	=========	===============
1	Working with People	3.0
2	Working with Numbers	3.2
3	Written Communication	3.7
4	Reading	4.0
5	Oral Communication	4.1
6	Working with Money	4.8
7	Working with the Computer	5.0

Kendall Coefficient of Concordance--.121

P-value--.000

skills. This indicates the possibility that interpersonal skills are being developed through work experience. The general mathematical orientation of the 100 managers (specifically the younger and less experienced managers) very likely reflects the quantitative and analytical nature of their education.

It is bothersome, however, that natural language skills (especially speaking) do not exhibit consistently higher rankings. Speaking, reading and writing have been identified by previous research as the primary activities of managerial work. It is encouraging, though, to find some indication that these managers feel good about their abilities to work with other people. Interpersonal skills are of great value in forming and maintaining a manager's network of cooperation.

Generally all the managers--regardless of age or experience--rated their computer skills low relative to other skills. The older and more experienced managers were generally more negative about the strength of their computer skills. The lower ranking for computer skills, while not surprising, should be of some concern since this technology has tremendous potential to transmit and receive information.

The research subjects were also asked to rate their typing and computer skills relative to their peers. Figures

12 and 13 summarize their responses to these questions.
Typing ability, considered by some to be a drawback in the
use of the the computer, was considered by many (51%) to be
a relatively strong skill. Only 24% of the managers,
however, felt just as comfortable in computer applications.
This indicates some loss in confidence or skill level in
terms of being able to meaningfully work with the computer.
This also tends to support the low ranking of computer
skills relative to other skill categories. Despite the
consistently low ranking of computer skills, 60% of the
research subjects have purchased a home computer.

   Summary. Most of the 100 research subjects were
male and worked in Air Force Systems Command. A good deal
of the managers worked at Aeronautical Systems Division;
however, other Systems Command product divisions were also
represented in the sample. The managers were evenly
distributed in terms of age, military rank and civilian
grade. In addition, there was a good mixture of individuals
who claimed to have supervisory responsibilities. All the
research subjects had college degrees--55% had postgraduate
degrees. In general, these managers felt their strongest
skills were interpersonal (working with other people) and
quantitative (math and engineering). Computer skills were
consistently ranked lower than all others. Many felt
comfortable with their ability to type, but less confident
in their ability to work with the computer.

Typing Abilities Relative to Peers
Self-Perceived Ability (proportion)

ABOVE AVERAGE (51%)

BELOW AVERAGE (17%)

AVERAGE (32%)
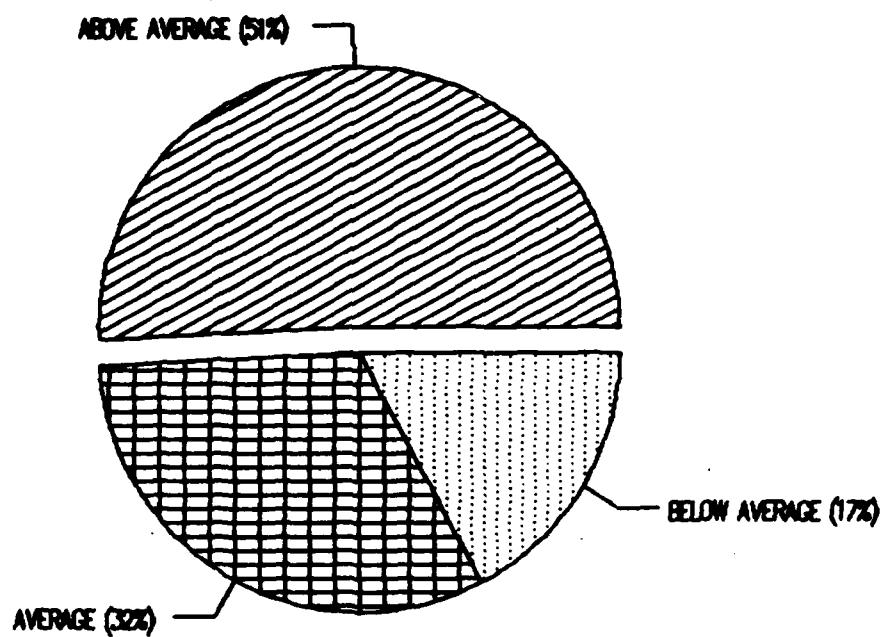
Figure 12. Typing Abilities Relative to Peers

Computer Abilities Relative to Peers
Self-Perceived Ability (proportion)

ABOVE AVERAGE (24%)

AVERAGE (48%)

BELOW AVERAGE (28%)
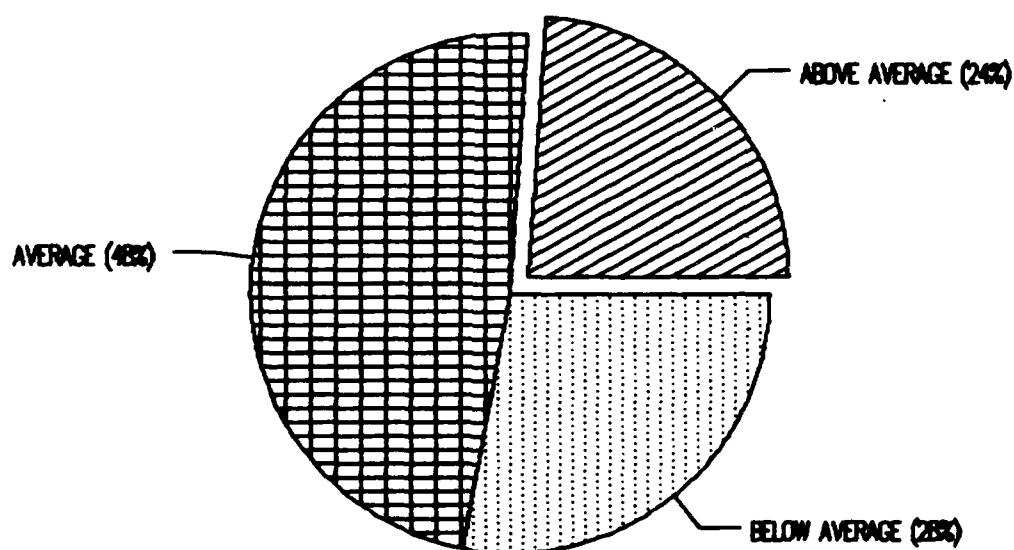
Figure 13.   Computer Abilities Relative to Peers

Work Environment

This section describes the work environment of the managers. First, some qualitative characteristics are presented. Next, a more quantitative measure of the complexity (measured in terms of different issues and people that comprise the manager's daily agenda) of their work environment is presented. The research subjects were also asked to rank-order certain resources in terms of their importance in achieving success in this environment. The section closes with a brief look at the tools these managers indicated were available to aid them in their work.

Qualitative Remarks. A large percentage (68%) of the managers indicated a fair part of their daily routines was taken up reacting to unplanned events. These managers indicated that they still were able to adapt and maintain some directional control over most of their projects. An even 20% of the managers indicated that most all of their day was spent reacting to one crisis after another. Perhaps more significant were the small numbers of managers who indicated they had little to do (8%) or considered themselves proactive (4%). When asked to verbally describe their work environment, several of the managers confirmed the reactive and busy nature of their work. A quick scan of the recorded responses in Appendix B tends to confirm the reactive, busy and uncertain nature of their environment. These results are consistent with much of the documented

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research of observed managerial behavior and tend to support Stewart's view that pattern 1 (fragmented, reactionary behavior) is the most common managerial work pattern.

In general, most of the managers indicated they had considerable freedom to do their jobs. This is pictorially represented in Figure 14. None of the work subjects indicated their work autonomy was severely restricted. The recorded verbal responses listed in Appendix B also tend to confirm this finding as several of the managers indicated that job freedom was a positive characteristic of their work.

A large percentage (48%) of the managers stated that they had to share some of the secretarial load in the office (helping answer telephones, making their own travel plans, and some typing). Eight percent (8%) indicated they had no secretarial support. This additional workload appears to be a fact of life for some Air Force middle-level acquisition managers. A heavy secretarial workload combined with a fast-paced and reactive environment calls for some sharing of this responsibility. This situation, however, does represent some potential for further distraction and interruption for managers who already indicate they are somewhat reactive.

Freedom to Conduct Work
Self-Perceived Freedom (proportion)

A Lot of Freedom (67%)

Complete Freedom (20%)

Some Freedom (13%)
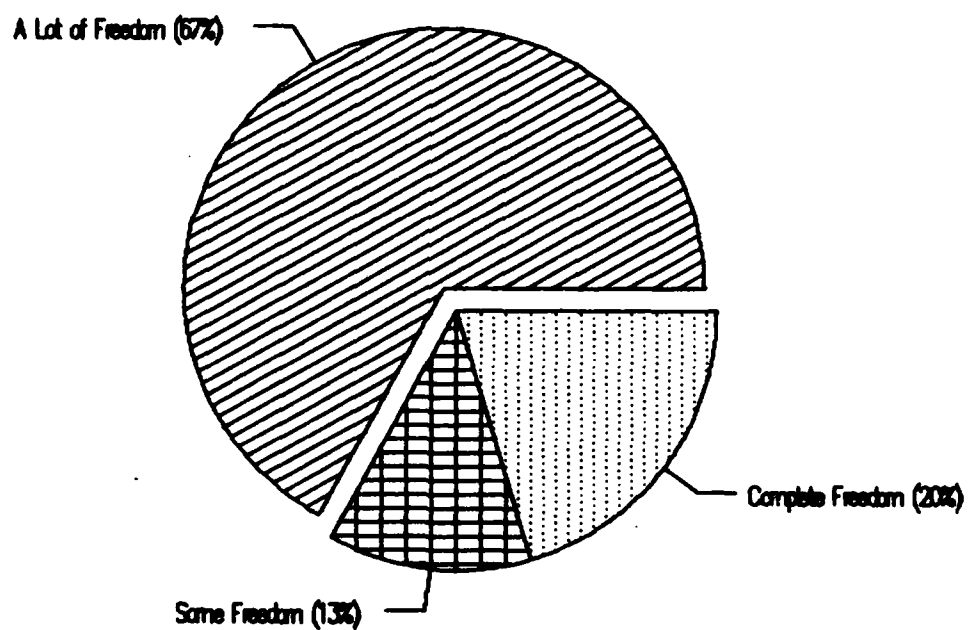
Figure 14. Freedom to Conduct Work

<u>Work Complexity and Uncertainty</u>. The research

subjects were asked to estimate the average number of

different people and issues they worked with on a daily

basis. The purpose of this question was to roughly gauge

the complexity of the their work. Figure 15 summarizes this

estimate. In general, Figure 15 confirms the busy and

varied nature of the acquisition manager's workday. Only a

handful of managers indicated they had few individual

contacts and/or worked a small number of issues on a daily

basis. This assessment is also consistent with the

self-perceived reactionary nature of their jobs. Further,

it indicates considerable potential for an often-interrupted

and fragmented daily schedule. The recorded responses in

Appendix B also support the varied, challenging and busy

workday indicated in Figure 15.

The uncertainty of acquisition management work also

appears to be great. On one hand, many of the managers were

positive about the freedom, responsibility, challenge,

diversity and the high-quality people that characterized

their work environment (see Appendix B). Their negative

responses, however, balance this picture. Several managers

cited lack of direction, little feedback, constant change,

the bureaucracy, regulations, long hours, short suspenses,

too much politics and too little support as negative

characteristics of their work (see Appendix B). The

combination of a heavy workload, short suspenses,

Managerial Work Complexity

% Managers vrs Work Variety
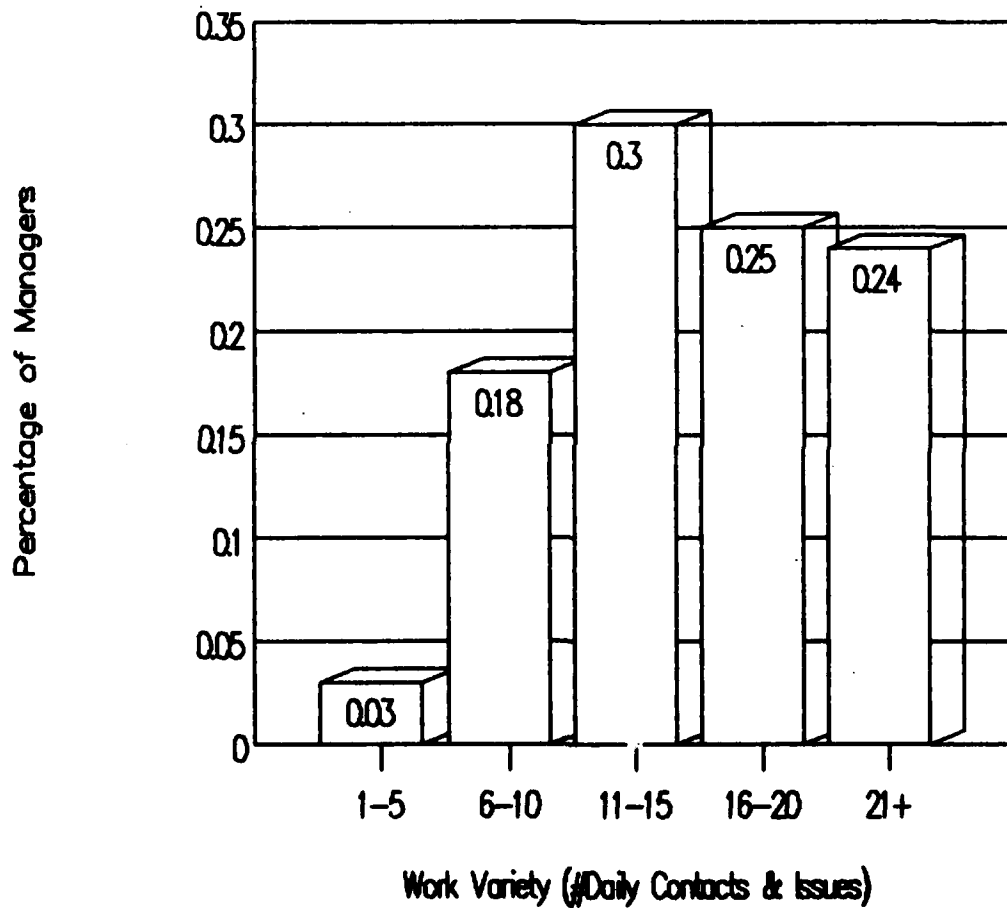
Figure 15. Managerial Work Complexity

considerable job freedom, constant change, politics and a strict set of regulations makes for a very complex, uncertain, conflict-ridden, if not explosive environment.

The research subjects were also asked to rank-order several resources in terms of their managerial importance. They were told to assume that money was not a factor. Table XI summarizes the rank-ordering of resources. Table XII summarizes the rationale most of the managers gave for ranking people as the most important resource. People and information were consistently ranked one or two relative to time, office equipment and office facilities. The Kendall coefficient of concordance in Table XI indicates there is reasonable agreement among the 100 middle-level managers. The p-value indicates that the rank-order is significant and allows us to reject the null hypothesis of no association in favor of the alternate hypothesis that people and information are considered the most important resources for these managers. Appendix C lists the recorded rationales each of the managers gave for their top choice. The office facility was never ranked as the most important resource. Office equipment was ranked most important only one time. Sixty-one percent (61%) of the managers ranked people as their most important resource. Thirty-three percent (33%) of the managers ranked information as the number one resource. Seventy-three percent (73%) of the managers felt

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Table XI

Rank-order of Managerial Resources

Rank	Resource	Average Ranking
1	People	1.5
2	Information	1.9
3	Time	3.1
4	Office equipment	3.8
5	Work Facility	4.7

Kendall Coefficient of Concordance--.670

P-value--.000

Table XII

Common Rationale for Choosing People

===

** People drive the program--they make it happen.

** People provide the information--they are the knowledge base.

** The manager cannot work by him or herself--the job can only be accomplished through effective teamwork.

** The heavy workload demands the need for motivated and capable people.

the office facility was least important in terms of successfully completing their work.

People and information fit comfortably into the managerial understanding developed in Chapter II. These resources make up the key ingredients of conversation and networking. The verbal responses in Appendix C actually indicate a link between people and information--whether one or the other is ranked number one is probably irrelevant. Many managers appear to rely on people for their information base (as opposed to a computer-based information system for example). In this regard, they are very much like Mintzberg's managers who did not favor formal information systems. Also, many of the recorded verbal responses in Appendix C show a definite concern for support. These managers reveal some natural understanding of the importance of a good network of help--they can rarely accomplish the job alone.

Availability of Tools. All the managers indicated writing devices (pencil and pens), telephones, typewriters, calculators, copy machines and fax machines were readily available in the office to help facilitate their work. In a few cases (less than 5%), fax machines were not located in the same building the manager worked in. In addition, almost all (99%) of the managers indicated computers were available for use in their offices. In fact, 40% of the

managers had personal computers sitting on top their work desks. Of special interest to this research was the indication that over 60% of the managers had some form of electronic mail capability readily available within their offices (via their computers). It is an understatement to say computers make up a significant portion of the landscape in today's Air Force acquisition office.

Summary. Most of the 100 research subjects work in an environment characterized by a significant number of daily contacts and work issues. These managers consider people and information the most important resources in this environment. Many of these managers indicate a tendency to be reactive in this environment. This tendency is similar to the managerial behavior discussed in Chapter II and is consistent with the potential variety and uncertainty of their work. These managers also indicate they have quite a bit of freedom to conduct their work. This freedom provides the potential to further amplify the variety of their work. In several cases, these managers are also sharing some of the office secretarial chores. Again, this added responsibility can interrupt and fragment an already busy workday.

There are a large number of tools readily available to help these managers in their work. Generally all the managers have computers in their offices--a large percentage

of the managers have personal computers sitting on top their work desks. In many cases, these computers provide an electronic mail capability in addition to word processing and analytical functions.

Work Characteristics

This section presents the work activities of the 100 research subjects. This section begins with a general description of the manager's workday. Next, a more detailed analysis of the work activities that make up the manager's workday is presented.

The Average Workday. The majority of research subjects work more than eight hours a day. Close to 60% of the managers indicated that they worked 9-10 hours a day--16% worked more than 11 hours a day. On top of this, close to 65% of managers indicated they worked an hour or more per day at home. Several of the verbal responses in Appendix B also tend to confirm that many of these managers are working long hours. These results are consistent with the previous research of Mintzberg and Kotter and support McCall's common managerial work characteristic of a long workday.

Despite the long workday, over 80% of the managers indicated they spent little time by themselves. Thirty percent (30%) indicated they spent less than one hour by themselves--55% indicated they were by themselves for only

2-3 hours. Generally all the managers appear to spend the majority of their workday in the presence of others. This work characteristic confirms the collective nature of managerial work and is consistent with Kotter's research. This finding is also consistent with the large number of daily contacts these managers indicated they had (see previous discussion on the complexity and uncertainty of the work environment).

When asked to choose a phrase that best described their typical workday, 50% of managers indicated they worked at a fast-pace with some discontinuity in their daily schedule. Another 20% felt their workday was best described by a hectic and unrelenting pace. Only six of the managers indicated they worked at an easy pace with a consistent schedule. These results support the apparent uncertainty and complexity of their work. In addition, it is consistent with the proportion (88%) of the sample that indicated some reactive behavior in their work environment. Again, several of the verbal responses in Appendix B support the fast-paced nature of acquisition management work.

Work Activities. The managers were asked to rank-order their most frequent work activities and management functions. Tables XIII and XIV present the results. Table XIII shows a rather strong agreement that conversation with others, reading and writing are the

Table XIII

Rank-Order of Managerial Activities

Rank	Activity	Average Ranking
1	Conversing with People	1.4
2	Reading Written Material	2.5
3	Writing Memos or Notes	2.7
4	Operating Office Equipment	4.2
5	Preparing to go on Travel	5.6
6	Mathematical Computations	5.8
7	Inspecting Products	5.9

Kendall Coefficient of Concordance--.713

P-value--.000

Table XIV

Rank-Order of Mangerial Functions

Rank	Function	Average Ranking
1	Coordinating	2.3
2	Investigating	3.0
3	Planning	3.5
4	Making Decisions	3.6
5	Resolving Conflict	4.8
6	Representing Organization	5.1
7	Supervising	5.7

Kendall Coefficient of Concordance--.323

P-value--.000

most common work activities of acquisition managers. Mathematical computations were consistently ranked close to the bottom. This rank-order is supported by previous research (note the similarity to Table II on page 46). The small p-value for the rank-order in Table XIII indicates that we can reject the null hypothesis of no association in favor of the alternate hypothesis that activities facilitating natural language are the most common work activities of Air Force middle-level acquisition managers. Given the varied and uncertain nature of acquisition work, it not surprising a rich language medium like face-to-face conversation is the most common work activity.

Table XIV indicates the most common managerial functions are coordinating, investigating and planning. The small p-value in Table XIV indicates we can reject the null hypotheses of no agreement. There is less agreement on the rank-order of managerial functions as compared to the work activities. The managerial functions of coordinating and investigating, however, are consistent with the ranking of people and information as the most critical resources in the work environment. In addition, they are also supported by the top work activities of conversing, reading and writing. The managerial functions of coordination and investigation are also supported by several of the recorded verbal responses in Appendices B and C (note also the similarity to Table III on page 46).

It is not clear how many of these managers are facilitating the planning function. Given the apparent fast-paced nature of acquisition work, it is likely many of these managers do not have time to satisfactorily reflect on the future. This possibility is indicated in several of the verbal responses in Appendix B--short suspenses and pressure don't always allow the manager time to put forth a well thought-out approach. The subject of how acquisition managers plan in a fast-paced environment is deserving of more focused research.

Given the large percentage (44%) of supervisors that were sampled, it was somewhat surprising to see the consistently low ranking given to the management function of supervision. Even within the group of supervisors, the average ranking of the supervisory function only moved up to the fifth position. This managerial function might be a victim of the manager's fast-paced and busy work schedule. Supervision may be getting outprioritized by other functions in the manager's daily agenda. The frequent verbal responses of considerable job freedom, poor feedback and lack of direction may be indications of the lack of a strong supervisory function for many of the research subjects. This should not be interpreted as a conscious decision on the part of most supervisors. More likely, it reflects the fast-paced day many of these middle-level managers are part of--too busy perhaps--to allow for adequate interaction with

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subordinates. The management functions of supervision and

representation may be higher ranked for Air Force

executive-level acquisition managers.

Conversation Types. The research subjects were

asked to identify the most common types of conversations

they took part in. They ranked their conversational

patterns in the following order:

1. A conversation where a manager was passing and
    receiving information was generally considered the
    most frequent type of conversational exchange.
    This is one type of a conversation for action.

2. Conversations consisting of requests, offers or
    acceptances of information and services--another
    type of conversation for action--was generally
    considered the next most frequent type of
    conversation.

3. Conversations where they were discussing possible
    alternatives for future action--one type of
    conversation for possibility--was generally
    considered the least frequent type of conversation.

The rank-order was statistically significant (p-value=.000,

Kendall=.305) allowing us to reject the null hypothesis of

no agreement in favor of the alternate hypothesis that

conversations for action were the most frequently occurring

managerial speech acts. The strength of this agreement is

really much greater than indicated as both of the top-ranked

speech acts are conversations for action. Managers gave

conversations for possibility a top ranking only six times.

The ranking of conversations for action as the most common

speech act is consistent with the top-ranked managerial

functions of coordinating and investigating. Conversations

for action also better fit the fast-paced nature of the acquisition manager's working day.

Preferred Communication Media. The research subjects were asked to rank-order their preferred media of communication. Table XV presents the results of that rank-order. Table XVI presents the most common rationale used by the managers to justify the consistently high ranking for informal face-to-face meetings as the most preferred communication medium. The rank-order in Table XV is significant allowing us to reject the null hypothesis of no association in favor of the alternate hypothesis that Air Force acquisition managers prefer rich, high-variety communication media.

Table XV indicates a preference for informal communication media. Informal face-to-face meetings were ranked first or second by 71% of the managers. These results are consistent with top-ranked managerial work activity of conversing with others. In addition, the preference for high-variety, rich communication media is consistent with the uncertainty and complexity of acquisition work. These managers appear to be sensitive to the requirement to match high-variety media to an ambiguous and fast-paced work environment. The preference for face-to-face conversation, the telephone and informal written notes highlights this sensitivity. The rationales

Table XV

Rank-Order of Communication Media

Rank	Medium	Average Ranking
====	=========================	===============
1	Informal Face-to-Face Mtgs	2.1
2	Telephone	2.2
3	Informal Written Notes	3.5
4	Formal Face-to-Face Mtgs	4.0
5	Formal Mail	4.7
6	Electronic Mail	5.3
7	Tours	6.2

Kendall Coefficient of Concordance--.488

P-Value--.000

Table XVI

Common Rationale for Informal Meetings

===

** A preference for face-to-face interaction.

** Ability to see non-verbal communications--you can see who you are talking to.

** Fast feedback in a comfortable situation.

** Efficient, timely, effective--easy to set up. ('they just happen').

** Effective for conveying and understanding ideas-- especially positive for gaining commitment.

** Allows for clarification--best way of avoiding misinterpretation.

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for giving a communication medium a top-ranking are listed in Appendix D.

Despite the availability of electronic mail in the work environment, managers consistently ranked it low relative to other communication media. One reason for electronic mail's low ranking may be a lack of managerial confidence or skill in using the computer. This possibility was discussed earlier during the presentation of the research subjects' educational backgrounds. In addition, some managers may feel that electronic mail is not capable of transmitting adequate information richness. Most electronic mail systems are not designed to facilitate management speech acts--specifically conversations for action.

One analysis concern was that managers who did not have an electronic mail capability were ranking it low (thus biasing the total ranking). The average ranking of electronic mail for those that indicated it was readily available in their office, however, was actually lower than the group as a whole.

Electronic mail does appear to have a capabilty to facilitate the linguistic capabilities of the manager across great distances--and this does seem to match the work situation many of these research subjects are faced with. More research should be accomplished to gain an understanding of why a powerful tool like electronic mail is

not a more preferred communication medium. The managerial use of office equipment will be addressed next.

Primary Tool Usage.

This section presents the tools acquisition managers are using to facilitate their work. First, a general assessment is made. Next, a more detailed analysis is provided.

General Assessment. All of the managers were asked to rank-order the tools most frequently used to facilitate their work as well as their primary uses of the computer. The rank-order of tool usage is presented in Table XVI. Table XVII presents a rank-order of computer applications. Appendix E contains the rationales each of the managers provided for their top-ranked tool. Not surprisingly, the telephone was generally considered the most used and important tool. The pencil or pen was generally considered more valuable than the computer; however, the computer was ranked in one of the top three spots by 50% of the managers. Table XVII provides a better understanding of why the computer is ranked among the top three tools--it has the capability to process the written word. Tools that facilitate the manager's ability to create and transmit natural language are the top-ranked tools--the computer joins this upper echelon because of its capability to word process.

Table XVII

Rank-Order of Primary Tool Use

Rank	Tool	Average Ranking
====	=============	================
1	Telephone	1.9
2	Pencil or Pen	2.9
3	Computer	3.8
4	Copy Machine	4.1
5	'To-Do' List	4.2
6	Fax Machine	6.2
7	Typewriter	6.2
8	Calculator	6.6

Kendall Coefficient of Concordance--.488

P-value--.000

Table XVIII

Rank-Order of Computer Applications

Rank	Application	Average Ranking
====	======================	================
1	Word Processing	1.4
2	Briefing Slides & Graphics	3.0
3	Analysis	3.6
4	Scheduling, Information	3.8
5	Electronic Mail	3.9

Kendall Coefficient of Concordance--.433

P-value--.000

Figure 16 indicates that roughly 50% of the research subjects appear to be utilizing the computer three or more times a day. This is consistent with the percentage of research subjects that ranked the computer in one of the top three spots. There are also a few individuals who exhibited considerable computer use.

Some Detailed Comments. Both the rank-orders in Tables XVI and XVII are significant--the small p-values indicate we can reject the null hypotheses of no agreement in favor of the alternate hypotheses that managers primarily use tools that facilitate natural language. The telephone was ranked first or second over 70% of the time. The most common reasons for giving the telephone top-rankings were ease of use, flexibility of information exchange, quickness, the requirement to talk with contractors located at great distances from the home office, and the need to coordinate (previously identified as the most common managerial function). The high ranking of the pencil and pen indicates this simple tool is still being used by a great many managers to facilitate their natural language skills. Technologists might be dismayed that the computer is still not considered more valuable or used more than the pencil or pen. The computer, however, is still a relatively new tool in the military office. No one should expect the computer to rise immediately to the top of the managerial use column. The percentage of managers (50%) indicating they use the

Daily Computer Usage

% Managers vrs Daily Computer Use
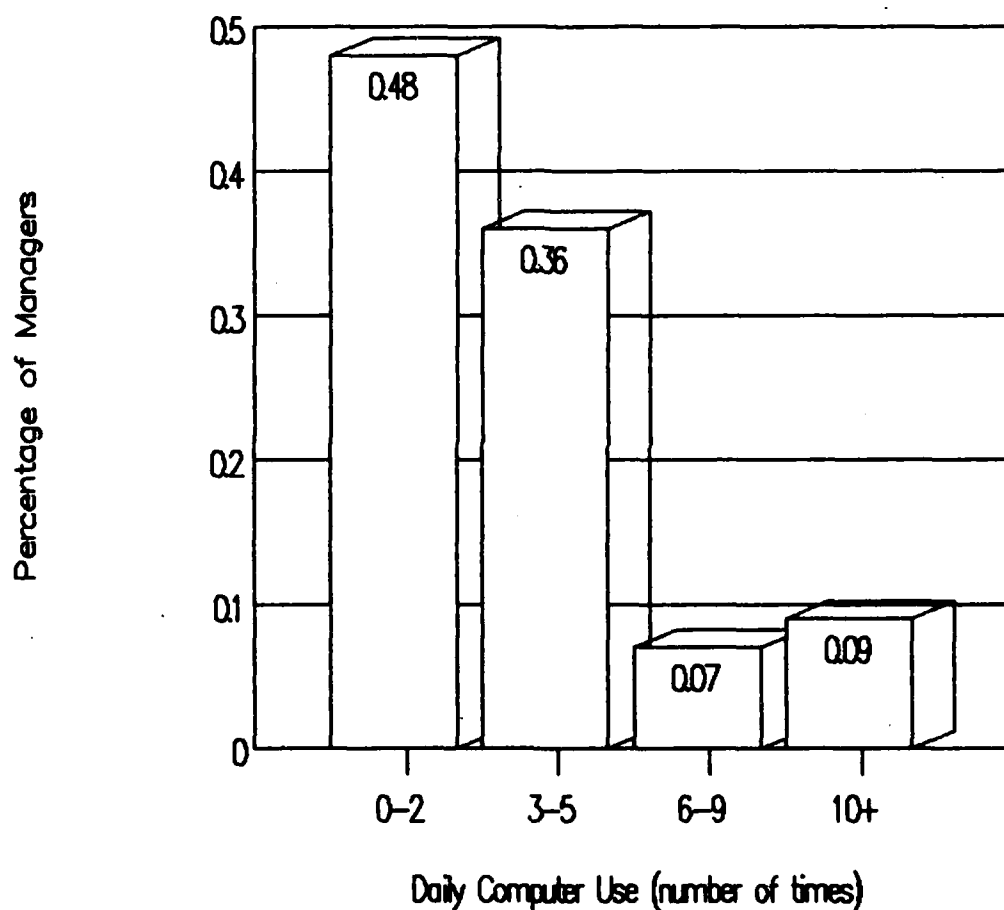
Figure 16. Daily Computer Usage

computer on a daily basis (at least 3 times a day) is probably greater than the number who would have indicated the same use two years ago.

It is significant to note that the computer's relatively high managerial use ranking is most likely the result of its capability to facilitate natural language. This research makes it difficult to accept the common criticism that computers are being underutilized because they are only being used for word processing. The manager's world is dominated by natural language. These results as well as previous research confirm that. Computers are playing a big role in managerial work because they are machines designed to act in natural language. In 1975, Harold Leavitt wrote that the 'number-oriented' and 'computer-assisted' management decision-maker had not become a reality (Leavitt, 1975:5). As we approach 1989, this still appears to be the case for Air Force acquisition managers. The computer, however, does appear to be firmly establishing itself as useful and important managerial tool for facilitating natural language.

While the word processing capability of computers attracts several managers, apparently the electronic mail capability has not yet taken hold. The consistently low-ranking of electronic mail as a preferred communication medium and as a computer application needs to better

understood. Electronic mail combines the capabilities of
word processing with many of the same advantages of the
telephone. It would seem that such a mixture of
capabilities would be used by managers.

Other than the telephone and the pencil or pen, the
simple 'to-do' list received the most top-rankings.
Apparently, some proportion of acquisition managers are
trying to use such a tool to maintain some schedule or
prioritization in their daily activities. One manager
indicated that he used the 'to-do' list to plan what was not
going to get accomplished each day. The existence and use
of 'to-do' lists indicates several managers are pursuing
some directional heading or daily agenda despite the
fast-paced nature of their work.

Calculators and typewriters were most always ranked in
one of the bottom spots. The low ranking of calculators is
consistent with low ranking of mathematical computations as
a common managerial activity. The low ranking of
typewriters is an indication that computers are taking over
its once dominant role.

The rank-order of computer applications confirmed the
dominance of word processing as a primary computer
application for managers. Seventy-three percent (73%) of
the research subjects gave word processing the top ranking
(86% ranked it one or two). This supports the alternate

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hypothesis that there is agreement on the primary use of the computer in facilitating natural language. Making briefing slides was generally ranked second. Again, this second computer application is often centered on facilitating natural language. The proper wording and arrangement of a briefing slide often makes the difference between the successful transmittal of the information (meaning) or confusion (lack of understanding). Electronic mail, analysis, calendar, notebook and information applications were generally given lower rankings. One can presume from the rank-order and previous results that these latter applications are not being frequently used by Air Force acquisition managers.

The rank-order of computer applications tends to confirm the previous finding that few computer-based decision aides or information systems are being used. Such systems are just beginning to take root in Air Force acquisition offices so this finding is not all that surprising. On the other hand, many management writers were saying in 1970 that the promise of computer-aided managerial decision-making was long overdue (Vandell, 1970:83). Computer-based management information systems (MIS) and decision support systems will have to compete with what appears to be a rather strong preference for informal, face-to-face, information networks--and rightfully so--the acquisition environment does seem to be characterized by

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significant uncertainty. Whether computer-based MIS and decision-aide applications see widespread use by Air Force acquisition managers remains to be seen.

Chapter Summary

One-hundred middle-level Air Force acquisition managers were surveyed as part of this research. These managers comprised a mixture of civilians and officers, males and females, experience levels and age groups. Generally, the research subjects were assigned to Air Force Systems Command. All of the Systems Command product divisions as well as some test and engineering development centers were represented in the sample. Sixty-five percent (65%) of the research subjects were directly assigned to System Program Offices. The research subjects were all well educated--55% of the managers had completed post-graduate work. Their self-perceived skills varied, but generally, they considered their interpersonal and quantitative skills stronger than their speaking, writing or computer skills.

The majority of these managers indicated they were working in a reactive environment characterized by a large number of daily contacts and work issues. These managers ranked people and information as the most critical resources in this environment. A wide range of tools were available to help these managers conduct their work. Computers were in most all (99%) offices--over 40% of the managers had

computers sitting on top their work desks. Sixty percent (60%) of the managers indicated they had some form of electronic mail capability readily available.

Most of the research subjects worked long days and spent little time by themselves. The most common work activities were conversation with others, reading and writing. This confirmed the conceptual understanding, developed in Chapter II, that activities facilitating natural language characterize the working domain of most managers. In this research, such a characterization appears very representative of Air Force middle-level acquisition managers. The research subjects indicated the managerial functions of coordinating, investigating and planning best explained the purpose of their work activities. These managers indicated that conversations for action best typlified their most frequent conversations and showed a strong preference for informal face-to-face conversation.

The tools these managers used were those that facilitated their primary activities. The telephone, a pencil or pen, and the computer were generally ranked one, two and three in terms of usage. The computer held this position because of its word processing capability--in other words--its design as a machine of natural language. At least 50% of the managers appear to be using the computer on a daily basis. Word processing was consistently ranked as

the most frequent computer application. The 100 managers do
not appear to prefer or frequently use electronic mail. In
addition, they do not appear to be frequently using
computer-based information systems, expert systems or
decision support systems.

V. Conclusion

What are managers doing when we say they are working?
This question has inspired the likes of Henry Mintzberg,
John Kotter and Rosemary Stewart to spend much of their
professional careers observing, documenting and trying to
understand the actual work activities of managers. Such an
understanding is crucial if we want to improve managerial
processes, construct effective management education, and
properly design tools that facilitate and amplify primary
managerial activities. This study attempted to broaden
previous management work research by investigating the
primary work activities of middle-level Air Force
acquisition managers and the tools being used to facilitate
acquisition management work.

An extensive literature review was accomplished to
attain a satisfactory conceptual understanding for
investigating management work. In addition, a methodology
was designed to match the complexity of the research
setting. Data were gathered and analyzed to test research
hypotheses and address investigative questions. The entire
research process will be summarized in the next few
sections. Several additional research topics will also be
suggested. An argument for changing the structure of
management education is made at the end of this chapter.

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The Literature

While there are differences of opinions on the relevancy of different management theories, models, functions and roles, **the literature is consistent in highlighting the central role of natural language in managerial work.** Managers prefer to verbally communicate with other people--usually by means of face-to-face conversations. These conversations may be oriented towards gaining support from others for a project, or gathering information to support a continuous planning and control process, or resolving conflict among members of the manager's network of help, or perhaps simply to firm up a lunch engagement with a peer in another organization. Management work--real management work--is carried out primarily in the linguistic domain.

Several studies have focused on directly observing managers in actual work settings. In general, this research has characterized managerial work as busy, fragmented, varied, primarily oral, and filled with a large number of daily contacts. Most managers appear to work long hours. Previous research also indicates that managers are not reflective in a traditional sense--especially in regards to planning. There are managers who work at a different pace and have fewer daily contacts. These managers, however, appear to be exceptions. A large number of managers fall into Rosemary Stewart's fragmented and varied work pattern

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(she called this pattern 1). This work pattern best fits those managers who face challenging, uncertain and varied tasks. It was hypothesized that many Air Force acquisition managers fit in this work pattern.

Many consider information the key resource in this environment. The variety of managerial work creates the need for managers to gather information to reduce the uncertainty in their task environment. This information is often communicated via face-to-face conversation. Much of this conversation takes place within a manager's network of help and often in a very informal manner. This preference for informal face-to-face conversation results from the manager's need to match a communication medium capable of conveying rich information to an environment that is uncertain and complex. Managers seek to avoid misinterpretation. Rather, they strive to enhance meaning and understanding--and in short--build commitment for the support of their agendas.

The literature indicates a pattern among researchers to label managers as primarily reactive (as opposed to proactive). This reactive label, while supported by observational research, can lead to some misunderstanding of the purpose in managerial activities. Even managers who work at a fragmented and unrelenting pace (like Mintzberg's research subjects) appear to maintain some directional

control over their daily agendas. These managers could just as easily be labeled adaptive rather than reactive. Their so-called reactive behavior results more from their willingness to accept interruption so they can receive current information.

Some individuals have recognized the collective nature of managerial work (networks of cooperative relationships), the need to converse in this environment (conversations for action and conversations for possibility), and the managerial requirement to foster commitment within the network to act together. These individuals are designing and marketing work group productivity systems based on conversation theory and the many capabilities of the computer and telecommunications. Others are designing decision support systems to help managers reflect upon alternatives. Decision tools can help managers pick and choose among some bounded set of alternatives. Both work group productivity and decision support systems have their domains of use. Previous research, however, suggests the most promising domain for management tool design is the one that centers on facilitating the manager's linguistic skills. Several researchers also agree that management education needs to place a greater emphasis on developing natural language skills in the management student.

The Methodology

The methodology for this research was motivated by the desire to qualitatively assess middle-level Air Force acquisition management work. A qualitative, high-variety research approach was deemed more appropriate for the complex, varied and ambiguous organizational setting. In almost all cases, natural language was used to convey questions and receive responses.

The target population for this research was the Air Force middle-level acquisition manager. A questionnaire was used to survey a group of 100 Air Force middle-level acquisition managers while they were at AFIT attending professional continuing education classes. The questionnaire was introduced via an informal face-to-face conversation at which time misunderstandings were clarified. Both Air Force civil service employees and military officers were sampled. Several research hypotheses were postulated based on the conceptual understanding developed in literature review. Simple analysis techniques (pie charts and frequency histograms) and some nonparametric statistics were used to evaluate the data, test the hypotheses, and present the results.

The Results

The 100 research subjects comprised a mixture of civilians and military officers, males and females,

different experience levels, and age groups. The 100

research subjects met this study's criteria for being

labeled middle-level acquisition managers--they had a

minimum of two years acquisition experience and were

currently working in some acquisition activity. The

majority of the research subjects were assigned to Air Force

Systems Command. All of the Systems Command product

divisions as well as some test and lab organizations were

represented in the sample. Sixty-five percent (65%) of the

research subjects were directly assigned to System Program

Offices. The research subjects were all well educated--55%

of the managers had completed post-graduate work.

Forty-four percent (44%) indicated they had supervisory

responsibilities in addition to other managerial tasks.

Their self-perceived skills varied, but generally, they

considered their interpersonal and quantitative skills

stronger than their speaking, writing or computer skills.

Most of the managers indicated they were working in a

fast-paced environment characterized by a large number of

daily contacts and work issues. These managers ranked

people and information as the most critical resources in

this environment. A wide range of tools were available to

help these managers conduct their work. Computers were in

most all (99%) offices--over 40% of the managers had

computers sitting on top their work desks. Sixty percent

(60%) of the managers indicated they had some form of electronic mail capability readily available.

Most of the research subjects worked long days and spent little time by themselves. The most common work activities were conversations with others, reading and writing. Activities associated with mathematical computations were generally considered the least frequent managerial work activity. These findings were consistent with the conceptual understanding developed in the literature review. Activities that facilitate natural language characterize the working domain of most Air Force acquisition managers.

The research subjects felt the managerial functions of coordinating, investigating and planning best explained the purpose of their activities. There was less agreement on these functions as compared with the work activities. Coordination, however, was consistently ranked as one of the more frequently exercised management functions.

These managers indicated that conversations for action best typlified their most frequent conversation type and showed a strong preference for rich media like informal face-to-face meetings, the telephone, and informal written notes. These findings were also consistent with the conceptual understanding developed in the literature review.

Most managers used tools that facilitated their primary activities. These tools, in most all cases, were being used to assist the manager's linguistic activities. The telephone, a pencil or pen, and the computer were generally ranked one, two and three in terms of usage. The computer held this position because of its word processing capability--in other words--its design as a machine of natural language. At least 50% of the managers appear to be using the computer on a daily basis. Word processing was consistently ranked as the most frequent managerial computer application. The 100 managers, however, do not appear to prefer or frequently use electronic mail. In addition, they do not appear to be frequently using computer-based information systems, decision support systems or expert systems.

Recommendations for Additional Research

This study has barely scratched the surface of what needs to be accomplished in this subject area. There are several additional research topics that need to be addressed with a more specific focus. These topics will be discussed relative to Air Force acquisition management--but in reality--all of proposed topics are equally applicable to all domains of Air Force management. This study served to establish an initial understanding of the nature of Air Force acquisition management work. Similar studies can and should be accomplished in other Air Force managerial domains

(such as logistics, construction, hospital, operations, personnel management and so on). The following are some additional topics that could use this study as a conceptual basis for initiating further research:

a. A similar study should be conducted on Air Force executive-level acquisition managers. The same questionnaire could be used with some type of telephone or face-to-face follow-up for clarification. The researcher may also wish to make the questionnaire less strenuous by decreasing the number of variables the subject has to rank-order.

b. One may also want to confirm this study's results with a different research design--like direct observation.

c. More focused research needs to be conducted on how acquisition managers plan. Are they reflective planners? The fast-paced, hectic nature of their jobs is not likely to change--yet many insist they are planning. How are they planning? How can we help them?

d. Managers appear to converse almost continually-- especially numerous are speech acts associated with action. More study needs to be conducted on the structure and sequence of successful conversations geared towards attaining commitment. A significant amount of conceptual understanding is required to research this subject--as such--it may be more appropriate for doctoral study. A master's degree student may want to study the general subject content of acquisition management conversations. Is the conversation content technical or quantitative? Are the conversations qualitative in nature?

e. Work group productivity systems designed to facilitate management conversation (i.e., not just simple electronic mail systems) are being introduced into Air Force organizations as this conclusion is being written. Researchers need to focus on these organizations and study the productivity changes. The research possibilities are endless (new research methodologies using electronic media to gather data are also possible).

f. It would seem that electronic mail and acquisition work would mix. This research, however, does not confirm that. Time may solve this problem, but waiting could mean lost opportunity. A more focused understanding of electronic mail's capabilities and limitations in Air Force acquisition should be attained.

g. Computer-based information systems, decision support systems and expert systems will also become more commonplace in Air Force acquisition organizations. They have their domains of use. These domains need be studied in an actual work setting and compared and contrasted with those of other tools (like group communication systems).

There are more research topics that can be addressed. Those listed above, however, represent excellent points of departure from this research. No doubt, another six to eight additional research subjects will stem off the topics listed above.

An Argument For Change

The findings of one research project rarely represent a consensus for change. One research project, when combined with the findings of previous studies, can better serve as a platform for initiating change. Throughout the review of literature, most every researcher and popular writer took the opportunity to critique the emphasis in management education. In many cases, their critiques were not favorable. Often, their criticisms centered on the quantitative emphasis in management schools. In some instances, these criticisms were offered without benifit of clearly stated alternatives. A simple recommendation for more interpersonal skill development or additional language

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curriculum does not go far enough in terms of clearly
defining a platform for future action. Every practicing
manager's nightmare is an individual who highlights problems
and then leaves before offering clearly stated and workable
solutions.

What messages are people like Mintzberg, Kotter,
Stewart, Livingston, Leavitt, Pondy, Flores and Daft trying
to send? Is there too much quantitative emphasis in
management education, or is there just not enough balance?
Research indicates that managers need to be skilled at
speaking, reading and writing--many spend up to 80% of their
time accomplishing these activities. Does this mean we cut
back on quantitative classes such as management science,
accounting and statistics, in favor of more speaking and
writing classes? It may also be true that Air Force
acquisition manager's need to be able to speak, read and
write about technical and quantitative matters. Sometimes,
it is easy to dismiss such an understanding. The bottom
line is that most managers need a strong and balanced
general education that emphasizes quantitative,
organizational and verbal skill development!

Concentrating on classes that emphasize the
quantitative decision-making skills of managerial work is
rather like giving the manager a little ammunition--but not
the rifle. How often have we taught managers how to

initiate, organize and run a meeting? Where are we teaching

managers the fundamental skills and principles required to

initiate, access, and maintain a network of cooperation?

Where are we teaching managers the linguistic skills

required to gain and foster commitment within this cohesive

network? Why is there such an academic obsession with the

development of systems to aid the individual at the expense

of tools designed to aid the collective dimensions of

managerial work?

Managers must be able to effectively act in the

linguistic domain. This research supports the requirement

for Air Force acquisition managers to be skilled in the use

of natural language. Previous research also supports this

requirement for other managerial domains. Managers must

know how to initiate, maintain and gain commitment by means

of their linguistic skills. This type of ability takes

practice.

The concept of practice is missing from management

education. We don't let doctors practice medicine without

some form of internship. Athletes are not allowed to step

on the playing field just because they know the plays--they

must have also demonstrated some capability to perform them.

Most athletes can perform only as well as they practice.

So too in management, just reading a text or some case study

falls far short of the real educational requirement. It is

also a faulty assumption to look the other way and hope managers will learn essential skills on their jobs. Who has time to teach? How can we be sure appropriate skills will be reinforced? There is more than one way to arrive at the end result (maybe this is why we often turn our heads).

Why not bring the work environment to the management school or training course--perhaps by recreating the hectic and fast-paced working day of an Air Force acquisition manager via some type of simulated scenario. It is surprising how realistic such a simulation can be. Roles can be played. Immediate feedback can be provided by qualified observers (teachers). Different managerial activities can be attempted and modified. The bridge between education and practice can be shortened. Doesn't it make sense to mishandle your first multi-million dollar negotiation or important meeting in school--and learn from it?

Appendix A: <u>Research Questionnaire</u>

*** MANAGEMENT WORK QUESTIONNAIRE ***

<u>PURPOSE:</u> It seems that after years and years of research and thought, there remains considerable debate as to the nature of managerial work. Without a sound understanding of what YOU DO, it is difficult to design tools to help you--and even more difficult to construct educational curriculums to help develop the skills you require. YOU are an Air Force manager--and as such--you are most qualified to tell us <u>WHAT YOU DO ... and HOW YOU DO IT.</u>

<u>CONFIDENTIALITY:</u> You may be assured of COMPLETE PRIVACY in your responses to this questionnaire. There is no requirement for individual identification.

<u>ORGANIZATION:</u> This questionnaire has THREE PARTS:
1) Part 1 is about you...your demographics, **background** and skills.
2) Part 2 includes some questions about YOUR **work** environment. The purpose of these questions is to get a feeling for the atmosphere YOU WORK IN.
3) The final section includes questions regarding the nature of YOUR JOB. The purpose of these questions is to gather data on the **characteristics of your work**.

<u>INSTRUCTIONS:</u> With the exception of some demographic questions like your sex and age there are no right answers.

So take time to REFLECT on these questions.
Your answers should reveal
how you do your job
NOT
how you think you should do your job.

These are <u>YOUR ANSWERS</u>.
They reflect YOUR practice of management.

<u>APPRECIATION:</u> Your answers are vital to the results of this research. I would be most happy to answer any questions you might have...so feel free to call me at 513-254-8932.

THANK YOU FOR YOUR ASSISTANCE.

MARK C. CERISE
CAPTAIN/USAF
AFIT STUDENT

*** PART #1 - SOME QUESTIONS ABOUT YOU ***

(CIRCLE YOUR ANSWERS UNLESS OTHERWISE INSTRUCTED)

1) What is your SEX?   A) MALE   B) FEMALE

2) What is your AGE?   A) 20-25   B) 26-30   C) 31-35

                                    D) 36-40   E) 41+

3) Are you military OR civilian? A) Military B) Civilian

4) Please PRINT your military RANK (or civilian grade):

    _____   _____
       Military Rank   Civilian Rank

5) What is your military JOB CODE?   A) 27XX   B) 28XX

                                       C)_____
                                              OTHER

6) How many years of acquisition and/or logistics
    management EXPERIENCE do you have?

    A) 1-2   B) 3-5   C) 6-10   D) 11-15   E) 16+

7) What Major Command are you in?   A) AFSC B) AFLC C) AFCC

                                     D)_____
                                            OTHER

8) Do you work in a System Program Office?

    A) Yes   B) No   C) Don't understand

9) Are you a SUPERVISOR (do people work for you)?

                    A) Yes   B) No

10) Please provide some generic information about your organization and job title? **(Try to keep it top level)**

ORGANIZATION (ASD, AD, ESD, OO-ALC, ETC.)

JOB TITLE (PROJECT, TEST, ETC.)
Examples: TEST MANAGER
            CONTRACT MANAGER
            PROJECT MANAGER

11) Do you consider yourself FUNCTIONAL SUPPORT?

A)Yes   B)No   C) Don't Understand

nd

12) IF YES, what TYPE OF SUPPORT do you provide?

A) CONTRACTS B) TEST C) MANUFACTURING   D) CONFIGURATION

E) PROGRAM CONTROL   F) OTHER _____

13) What TYPE OF PROGRAM(S) are you involved in?

(pick a primary)

A)   AERONAUTICAL (AIRPLANES, CRUISE MISSILES, ETC.)
B)   BALLISTIC MISSILES
C)   SPACE SYSTEMS
D)   COMMUNICATION SYSTEMS
E)   ARMAMENTS   F)_____
                           OTHER (BE GENERIC)

14) What education level have you attained?

(Circle highest level attained)

A)HIGH SCHOOL
          B)COLLEGE (4-YR)
                    C)POSTGRADUATE (MASTER'S)
                              D)DOCTORATE

15) Reflect on your educational background AND work experience. Rank-order the following skill categories from 1 to 7 based on what **YOU feel YOUR** strongest and weakest skills are?

_____   MATH, ENGINEERING (WORKING WITH NUMBERS)

_____   BUSINESS (WORKING WITH MONEY)

                                                               1 - STRONGEST

_____   SPEAKING (VERBAL COMMUNICATION)   THRU

                                                               7 - WEAKEST

_____   WRITING (WRITTEN COMMUNICATION)

_____   READING (COMPREHENSION OF WRITTEN MATERIAL)

_____   INTERPERSONAL (WORKING WITH PEOPLE)

_____   COMPUTER (PROGRAMMING, APPLICATIONS, INFORMATION TECHNOLOGY)

16) Do you have a computer at home?   A) Yes   B) No

17) How would you rate your skills at typing AND using the computer relative to your peers?

TYPING _____ ABOVE AVERAGE _____ AVERAGE _____ BELOW AVERAGE

COMPUTER _____ ABOVE AVERAGE _____ AVERAGE ____ BELOW AVERAGE .

*** END OF PART 1 ***

18) Do you have a telephone at your work desk? A) Yes B) No

19) Do you have computers in your office? A) Yes B) No

20) Do you have a computer at your work desk? A) Yes B) No

21) Do you have an electronic mail capability
in your office? A) Yes B) No

22) Check the box which BEST fits YOUR position in your
organization?

SYSTEM PROGRAM DIRECTOR,
FUNCTIONAL CHIEF,
3-LETTER

DIVISION CHIEF

BRANCH CHIEF

PROJECT OFFICER
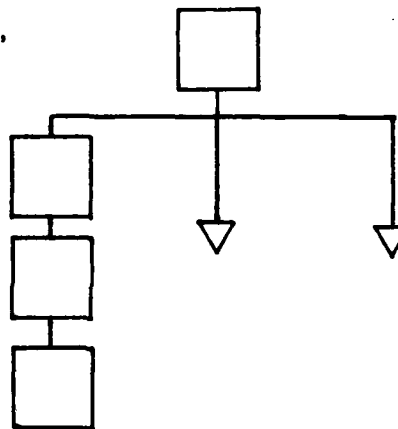
23) Which of the following phrases best describes your
SECRETARIAL SUPPORT?

A) I have NO support. I have to answer all my phone
calls, type all my correspondence and papers, make
all my travel reservations.

B) I have MODERATE support. I must usually share
phone, typing and travel responsibilities with my
secretary.

C) I have GREAT support. My secretary handles most or
all typing, travel and phone responsibilities in my
office.

D) I have GREAT support, BUT do all my own secretarial
work because I want to.

24) Which of the following phrases BEST describes your work environment?

    A) I am not asked to do a great deal. I generate most of my own work.

    B) I spend most of the day REACTING to problems...one crisis after another.

    C) I spend an even amount of time reacting to problems and keeping in touch with projects that are going well.

    D) I always seem to be ahead of the game. I ACT before a problem can surface.

25) Reflect on your work environment. Rank-order the following resources in terms of importance to the SUCCESSFUL completion of **YOUR WORK**? (1-most important thru 5-least important)

    * FUNDING (#) IS NOT A FACTOR

    _____ Work facilities...office structure, meeting rooms, etc.

    _____ Time...the time I have to spend at my work.

    _____ People...the people I work with--my network of help.

    _____ Office equipment...telephones, copy machines, etc.

    _____ Information...that I know, need, transmit or receive.

26) Briefly explain the rationale for **YOUR** most important resource.

----

27) Think of the NUMBER of different **PEOPLE** you talk with
(telephone or face-to-face) during the day. Also think
of the NUMBER of different **ISSUES** you discuss. Which
of the following best approximates the sum of those
numbers?

A) 1-5   B) 6-10   C) 11-15   D) 16-20   E) 21+

28) In general, which of the following best describes the
level of freedom you are provided in accomplishing YOUR
work?

A) Alot...complete autonomy

B) Quite a bit...some supervision

C) Some...but I must get approval for most
everything I do.

D) None...I have to do what I am told. Complete
Micromanagement.

29) Which phrase best describes YOUR interactions with
your co-workers?

A) I talk frequently with them during the day...we
socialize quite a bit outside of work.

B) I talk some with them during the day, we go out to
lunch...but we don't socialize much outside of
work.

C) I talk with them during the day...but not alot.

D) I talk to them if I have too...usually for work
reasons.

*** END OF PART 2 ***

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30) This question asks you to reflect on the tools that aid
    your work. Evaluate the list of items below. First,
    tell us whether the tool is readily AVAILABLE to help
    you. Next, rank-order the tools based on their
    importance to the SUCCESSFUL completion of **YOUR**
    work. Finally, rank-order the tools based on **YOUR**
    DAILY USE. (DON'T rate tools that are not available)

1-most important thru 8-least important

                           and   1-most use thru 8-least use

ITEM	AVAILABLE yes or no	IMPORTANCE	USE
COPY MACHINE	_____	_____	_____
TELEPHONE	_____	_____	_____
FAX MACHINE	_____	_____	_____
WRITING DEVICE (pencil or pen)	_____	_____	_____
COMPUTER	_____	_____	_____
TYPEWRITER	_____	_____	_____
'TO-DO' LIST	_____	_____	_____
CALCULATOR	_____	_____	_____

31) Briefly explain the rationale for your most important
    tool.

----

32) How many times a day do **YOU** use the computer?

    A) 0-2   B) 3-5   C) 6-9   D) 10+

33) Reflect on **YOUR** use of the computer. Rank-order
the following computer applications in terms of
YOUR use.

1-most used thru 5-least used

_____   Word processing

_____   Electronic mail

_____   Analysis (finance, decision analysis, PERT,
etc.)

_____   Calendar/Notebook (management information)

_____   Graphics...slide making, charts

34) On the average, how many briefings do you give each
week?

A) 0-1   B) 2-4   C) 5-8   D) 9+

35) On the average, how many meetings (formal and informal)
do you attend each week?

A) 0-5   B) 6-10   C) 11-15   D) 16+

36) On the average, how much TIME do you spend at work each
day?

A) 6-8 hrs   B) 9-10 hrs   C) 11-12 hrs   D) 13+ hrs

37) On the average, how much TIME do you spend working at
home each day?

A) none   B) less than 1 hr   C) 1-2 hrs   D) 3+ hrs

38) On the average, how much TIME do you spend by yourself
at work each day?

A) 0-1 hrs   B) 2-3 hrs   C) 4-5 hrs   D) 6+ hrs

39) WHEN YOU ARE BY YOURSELF AT WORK, what activities are you doing? Look at the following list and rank-order the items. 1-most common thru 5-least common

_____ I'm talking on the telephone

_____ I'm writing correspondence

_____ I'm preparing for a meeting or briefing - reviewing notes or slides

_____ I'm reading my in-basket

_____ I'm reflecting on my work...what I need to do, perhaps planning or thinking about a decision I have to make.

40) Which of the following phrases best describes a typical day FOR YOU.

A) Easy pace, I work on one thing, consistent schedule, time for myself.

B) Moderate pace, I work on a few things, some time to reflect on my work.

C) Fast pace, I work on several things, some discontinuity in my day.

D) Unrelenting pace, great variety, hectic daily schedule.

41) Which of the following is true?

A) I RECEIVE MORE information than I give out.

B) I GIVE OUT MORE information than I receive.

C) I give out about the SAME amount of information that I receive.

42) Rank-order the following methodologies based on how YOU make MOST of your decisions?

1-most used thru 4-least used

_____   I work with the aid of a set of rules. I usually refer to regulations, 'how-to' books, and specifications that tell me how to do my job.

_____   I work with the aid of regulations, BUT I also mix this guidance with some of my work experience.

_____   I take time to investigate, evaluate, and choose the best course of action.

_____   I rely on my intuition, knowledge, and basic understanding of the problem.

43) Rank-order the following phrases based on what best describes the way YOU formulate your viewpoints, opinions, or beliefs regarding your work?

1-most used thru 4-least used

_____   My viewpoints result from previous work experience (background) and what I learned from it.

_____   My viewpoints primarily result from the organization I work in, the ideas of my boss, my organization's mission.

_____   I base my viewpoints on a set of assumptions that I feel are right. These assumptions are not necessarily based on my work experience...but I feel they are self-evident.

_____   My views are based on scientific method...they are clearly defined, testable and repeatable.

44) On the average, how many days per month do you travel?

A) 0-3   B) 4-6   C) 7-10   D) 11-14   E) 15+

45) Reflect on your typical work day. Rank-order the following work activities from 1 thru 7 based on the percentage of each day you spend on each activity.

   1-most common activity thru 7-least common

   _____ Mathematical computations

   _____ Operating office equipment

   _____ Conversing with other people (telephone or face-to-face)

   _____ Writing correspondence or reports

   _____ Reading/reviewing written material

   _____ Inspecting products or equipment

   _____ Preparing to go on travel

46) The following are some classical management functions. Rank-order each of the functions from 1 to 7 based on the average amount of time you spend doing each function during YOUR typical work day.

   1-most common thru 7-least common

   _____ Planning for present and future projects

   _____ Coordinating verbal and written information

   _____ Making Decisions

   _____ Seeking information for investigative purposes

   _____ Representing your organization (at staff mtgs, ceremonies, etc.)

   _____ Supervising subordinates

   _____ Resolving conflict and negotiating agreement

47) Reflect on the type of verbal conversations (telephone and face-to-face) you have during the typical work day with your co-workers, contractors, operational users, etc. Rank-order the following conversation types from 1 to 3 based on frequency of occurrence in **YOUR** typical work day.

   1-most frequent thru 3-least frequent

_____ Conversations oriented towards making future events happen - usually consists of making requests and offers for information and services. These conversations generate commitments for immediate or future action.

_____ Conversations where I am passing and/or receiving information.

_____ Conversations about possibilities - reflecting about what can happen in the future...talking about alternatives. No commitments here - just possibilities.

48) On the average, how many phone calls do you take part in during the work day?

A) 0-5   B) 6-9   C) 10-14   D) 15+

49) Which of the following is **TRUE** for you?

A) I go to more informal meetings than formal meetings.

B) I go to more formal meetings than informal meetings.

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50) Evaluate the following work communication/information media. Rank-order them in order of **YOUR** preference (with 1 being most preferable).

_____ interoffice notes (written-informal)

_____ mail (typed-formal)

_____ formal meetings (verbal, face-to-face)

_____ telephone (strictly verbal).

_____ informal meetings (verbal, face-to-face)

_____ electronic mail

_____ tour (information you receive or transmit during a plant tour)

51) Briefly explain the rationale for your most preferable media choice.

----

52) This is your FINAL question.

Think one last time about your work.

Now write in short sentences or phrases TWO things that are POSITIVE about your work

AND

TWO things that are NEGATIVE...

These are **YOUR** feelings, please.

By the way, thank you for **YOUR** effort!!!!

TWO POSITIVE THINGS	TWO NEGATIVE THINGS
1.	1.
2.	2.

Appendix B: Positive and Negative Work Perceptions

The 100 research subjects were asked to list two things that were positive and two things that were negative about their work. The questions were open-ended--they were allowed to answer in short phrases. The following are their responses:

Positve Remarks	Negative Remarks
===================	===================
People in SPO work hard.	Massive reorganizations.
Contractors willing to help.	Constant change.
Job is people-oriented.	My talent is not fully used.
Working tools are available.	Rewards are short to none.
Making a contribution.	Bureaucracy.
Working with people.	Poor outside support.
The co-workers.	No promotion possibilities.
Good training opportunity.	Micro-management.
Management experience.	Bureaucracy.
Progressive thinking.	Not enough help.
Positive, can-do approaches.	Difficult to keep informed.
Office automation equipment.	Lack of direction.
Job freedom.	Lack of adequate facilities.
Creative thinking.	Unknown budget.
Good feedback.	No direction.
Wide variety of tasks.	No job definition.
Close to the action.	Constant major change.
Challenging.	Too reactive.
Good people.	Too much bureaucracy.
Job freedom.	Civilian employees.
Job satisfaction.	Regulations.
Good learning environment.	No authority.
Different things to do.	Coordination takes too long.
Job autonomy.	Consistently undermanned.
Sense of accomplishment.	Frequent reorganizations.
Job autonomy.	Heavy workload.
Diversity.	Undermanned.
Job freedom.	Lack of direction.
Minimal supervision.	Talent goes unused.
Adequate resources.	Too much bureaucracy.
Good people.	Too reactive.
Job freedom.	Unknowledgeable boss.
Job freedom.	Putting up with regulations.
Good facilities.	Bad support.
Job freedom.	Boss ignores non-performers.
Challenging.	Too many bosses.
Potential rewards.	No positive feedback.
Travel.	No direction.
Good communication w/user.	Inconsistent direction.
Able to see results of effort.	Little advancement.
Seeing a system develop.	Filling out surveys.

Positive Remarks (cont)	Negative Remarks (cont)
Experience I am gaining.	Attitudes of team members.
Job accomplishment.	No support from boss.
Challenging.	Little functional support.
Future employment opportunity.	Bureaucratic civilians.
Great people.	Unproductive co-workers.
Job freedom.	Work is sometimes boring.
Responsibility.	Micro-management.
Opportunity to influence.	Always answering what-ifs.
Responsibility.	Bureaucracy.
Autonomy.	Quality of life is poor.
Interesting.	Bureaucracy.
Contributing to defense.	Results not quantifiable.
Good people.	Distance from family.
Challenging.	Instability of management.
Professional people.	Pressures of acquisition.
Manageable workload.	Untrained subordinates.
Responsibility.	Undefined hardware items.
Co-workers.	The System.
Nature of the job.	Stupid rules.
Variety of work.	Job uncertainty.
Cooperative people.	Instability of direction.
Professional people.	Dealing with non-performers.
Program Management.	Long hours.
Good people.	Too many formal meetings.
Important work.	Not enough structure.
Interesting work.	Frustrating at times.
Challenging.	Bureaucracy.
Management experience.	Too much paperwork.
Responsibility.	Inconsistent policies.
Interesting work.	Too much travel.
Important to Nat'l Security.	Bureaucracy.
Interface w/ new technology.	Poor work environment.
Professional co-workers.	Lack of funding.
Job satisfaction.	Politics.
Interaction with others.	Politics.
I keep busy.	Too busy to do things well.
Good people.	Results are slow in coming.
My assessment is valued.	Responsibility--no authority.
Technology is exciting.	No administrative support.
Challenging.	Not enough training.
Job accomplishment.	Not enough guidance.
Like collecting information.	Little support from below.
Good people.	Officer/NCO relationship.
Job satisfaction.	Additional duties.
Job accomplishment.	Frequent travel.
Challenging & rewarding.	Fast pace reduces planning.
Challenging.	Can't get good people.
Considerable freedom.	Not enough money.
Freedom.	No one understands testing.

Positive Remarks (cont)	Negative Remarks (cont)
Chance to coordinate project.	User doesn't specify needs.
Responsibility is great.	Lack of recognition.
Travel.	Little realistic feedback.
Clear objectives.	Little outside support.
Good tools.	Little accountability.
Making things happen.	Strict rules.
Real responsibility.	Too much paperwork.
Interesting work.	Lack of direction.
Responsibility.	Continual change in plans.
Responsibility.	Micro-management.
Fast-paced work.	Scapegoat rule.
Challenging.	Poor office environment.
Working with people.	Low pay.
Challenging.	Rapidly changing baseline.
Job accomplishment.	Too much help from above.
Good job.	Too much to do.
Enjoyable.	Shortage of people.
Contribute to Nat'l Defense.	Can't get good people.
I have a large say.	Poor staff support.
Decision-making.	Others'poor work effort.
Receipt of information.	Supervisor.
Challenging.	Responsibility w/o control.
Responsibility.	Rules.
Autonomy.	Politics.
Exciting.	Work facilities.
Challenging.	Unskilled subordinates.
Stimulating.	Fast-paced work schedule.
Diversity of activity.	Politics cause instability.
Job accomplishment.	Work overload.
People trust my lead.	Lack of visibility.
Challenging.	Crisis lifestyle.
Interesting.	Lack of structure.
Good people.	No feedback from boss.
Almost total authority.	One lazy co-worker.
Productive.	Lack of feedback.
Creative.	Too many political goals.
Job freedom.	Short suspenses.
Challenging work.	No regard for people.
Variety of tasks.	Contractor more experienced.
Challenging work.	Poor work facilities.
Freedom of action.	Too much coordination.
Good support from boss.	No administrative support.
Challenging.	Everybody beats on us.
Good work variety.	Inexperienced employees.
Important work.	Too much travel.
Challenging.	Outside influences.
Good learning experience.	Job pressure.
Good people.	Constant change.

Positive Remarks (cont)	Negative Remarks (cont)
===	===
Challenging.	Crisis management.
Responsibility.	Questionable directives.
Challenging.	Low visibility.
Autonomy.	No help.
Job freedom.	Must depend on others.
Opportunity to learn.	Too many suspenses.
The people.	Non-sensical 'what-ifs'.
Work diversity.	Periodic time crunches.
Knowledge gained.	Overworked.
Promotion potential.	High pressure.
Quality of work.	Too busy to do things well.
Timely.	Work day is too long.
Exciting and interesting.	Long hours.
Good experience.	Several mundane tasks.
Good people.	Contractor responses.
Challenging job.	Short suspenses.
Challenging position.	Too much to do.
Work with good people.	Manpower shortage.
Goal-oriented.	Too much micro-management.
International flavor.	Inconsistent management.
Great program overview.	Excessive work time.
Good learning environment.	Some gopher work.
Automation of office.	Lack of system perspective.
Information accessibility.	Time to coordinate is great.
Program influence.	Little guidance.
Challenging.	Usually behind on status.
Interesting work.	Regulations.
Chance to excell.	Bureaucracy.
Job responsibility.	Not enough computers.
Freedom to manage.	Short manpower slots.
Good people.	Too many meetings.
Freedom of choice.	Short suspenses.
Dynamic.	Low verbal reward.
Challenging.	Excessive travel.
Responsibility.	Too much travel.
Self-paced.	Obnoxious co-workers.
Versatility.	Coordination process.
Interaction with peers.	Bureaucratic answers.
Important to program.	Management doesn't listen.
Good learning experience.	Ignored.
Job responsibility.	Conflicting priorities.
Access to supervisor.	Don't see results.

Appendix C: <u>Top Resource Explanations</u>

The 100 research subjects were asked to explain their rationale for their most important managerial resource. The list of resources included: people, information, time, office equipment and office facility. The following are the explanations for their top-rated choice:

People
======

People drive productivity.
People provide information--source of satisfaction.
With good people you can accomplish anything.
People are the drivers of the program.
People are the greatest source of information.
People control everything external to me.
People are important in the coordination process.
Need people who understand what's going right & wrong.
I can only accomplish my job through people.
Mission depends on people.
As a manager, I must have workers.
I can't get anything accomplished without people.
It's people who get the right things done.
Good & knowledgeable people allow me to accomplish job.
The people are very qualified.
The job can only be accomplished with effective teamwork.
The workload drives the need for motivated & capable people.
Without people you can do nothing.
My work relies on the support of functionals.
People do most of the work in program management.
I depend on people for information.
People make the difference--good or bad.
Without people you cannot do the job.
Functional support is the most critical element.
People are the most important assets on the test team.
I can't do it all myself.
Need people to get information.
No one individual has all the information.
People are the knowledge base.
Work will not get done unless the people do it.
People make it happen.
No one knows it all--we must be a team.
Job is large and dependent on several people.
People want most what they have least.
People do the work--they know the info I need.
People get the job done.
Need for constant dialogue.
People are the source of information.
Without good people, nothing would get done.
I need people to help me figure out what needs to be done.

People (cont)
=============

Nothing can be completed without people.
I can't manage without people.
I rely on my functional team members--critical to success.
Need other people to accomplish my work.
People do the work for me, I count on their support.
I need people to support my information structure.
As a manager, I must have workers.

Information
===========

Need information to respond about program.
The other resources are merely tools to disseminate info.
I require accurate info to discover & correct problems.
I can't make decisions on limited information.
Satellite ops--always need real-time info on craft status.
My job concerns the distribution of threat information.
Info is necessary to make decisions & get job done.
Program Manager needs healthy, information crossfeed.
I am an information broker between the program & commands.
Without accurate information, we're dead.
What you know is critical--links to people.
My job is information--quality, quantity & communication.
Information is required to know what is going on.
Need to know information to perform my job.
Need information to know what, when & how to do job.
Information is central.
No information--no good decisions.
Knowledge is needed to effectively complete my job.
If I don't know, everything else is useless.
You need information before you go to the right people.
I compile, consolidate & provide information from 10 SPOs.

Time
====

Too much work--too little time--poor end result.
In reaction mode, short suspenses mean little time.
Little time means I can't submit good products.
It is hard to find time to concentrate on my project.
Time is a finite resource--always insufficient.

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Appendix D: Preferred Communication Media

The 100 research subjects were asked to explain the
rationale for their most preferred medium of communication.
The list of media included informal face-to-face meetings,
telephone, informal written notes, formal meetings, formal
mail, electronic mail and tours. The following are the
rationales for the top-rated choices:

Informal Meetings--Face-To-Face
================================

Interact directly with people.
Fastest feedback with most information.
Immediate feedback--comfortable situation.
Easier to get info when to face-to-face & informal.
I can see who I'm talking to--more than just verbal comm.
Assurance of accurate, real-time information.
Can read non-verbal communications.
Most efficient.
Timely--I can't wait for it to come to me.
Little or no effort to set up--they just happen.
Great interaction.
I'd rather see a person face-to-face & ask questions.
Least time consuming--better to see reactions.
Face-to-face is more positive--especially for commitment.
Takes less time and is more effective in conveying ideas.
Feedback is immediate.
You get more info and understand it better.
It allows time and situation for instant clarification.
Comfortable and builds the best support.
Get more and better information when face-to-face.
It's the quickest and best way to solve internal conflicts.
You know where the problem and actual disagreement lies.
Can recognize non-verbal communication cues.
I get much more info out of informal face-to-face meetings.
I prefer face-to-face exchanges.
Face-to-face, when possible, works better than the phone.
Good place to transmit info with little misinterpretation.
Can ask questions for clarification--work on specifics.
Can ask questions to clarify uncertainty.
Get immediate feedback and usually better cooperation.
Get the info the quickest.
Great flexibility, direct feedback & personal interaction.
Can get more info and avoid miscommunication.
I get more commitment for action on important things.
Quick action.
Prefer face-to-face interaction.
Maximum info flow both ways--excellent feedback loops.
Max info, body language and better 'contact'.

Informal Meetings--Face-To-Face (cont)

Accomplish more due to lack of formality restrictions.
This is how I collect info about subordinate's projects.
Easier to get point across and people can give you feedback.
Prevents isolation within the organization.
Person-to-person is the only way to do business.
Face-to-face provides immediate feedback.
It expedites the communication process.
Can develop better working relationships thru informal mtgs.
Most efficient way to communicate.

Telephone
=========

Most expedient method.
Quickest.
Quick communication allows me to steer the conversation.
Quick, easier--reduces distance.
I talk with people all over the country.
I have a real-time need to communicate outside organization.
Quickly gather information.
Faster, personal and I choose when to call others.
Faster, quicker and complements written follow-ups.
Quick response.
Quick, effective and allows interaction.
Fastest access to information.
Transmits information quickly.
Quickest way to exchange information.
Fastest means of getting and giving information.
You get the most done in the quickest manner.
Quick way to get information.

Informal Written Notes
========================

Quick but yet documented for future reference.
Much of my work requires documentation.
Opportunity presents itself most often.
Quick means of staying informed that is semi-documented.
Most timely, yet provides a record.
Written beats verbal, formal isn't very good.
Easily transferred and fast moving.

Electronic Mail
================

Quick, ready access with built-in record.
Virtually real-time and you have a hard copy.
E-mail is great for a hectic office. Super management tool.
Quick and precise.

Formal Written Mail
====================

Possibility of misunderstanding is limited.
Less chance of misinterpretation.
Hardly any chance of misunderstanding.
Documented information.

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Appendix E: Most Important Tool Explanations

The 100 research subjects were asked to rank-order their most important and most used managerial tools. The following are the rationales given for ranking a tool as most important:

Telephone
==========

Need to talk to higher headquarters, user & contractor.
I have to talk to people in every part of the country.
Very important to coordinate with others.
Phone saves a lot of running around--used to coordinate.
Saves time.
Provides current information & confirm event occurrences.
I have to talk to several people to find out requirements.
Used to contact operational user & contractor.
Most efficient way to communicate outside of office.
I must coordinate, direct & get info from outsiders.
Communication is essential.
Need to communicate quickly for test activities.
Phone is primary means of contacting the people who test.
I mostly do coordination.
Keeps you in touch with people outside the organization.
Most effective tool for greasing the coordination cycle.
Easiest way to get info from people in different buildings.
Quick, personal coordination.
Informal coordination is often accomplished by phone.
Communication is very important in my job.
Readily available--highly effective.
Need to use phone for immediate exchange of information.
Got to have phone for communications & problems solutions.
Need phone to communicate with other managers & contractors.
Need phone for coordinating, directing & obtaining info.
Need to communicate with organizations outside my own.
Essential for information.
Need to communicate with contractor.
Primary communication medium for information.
That's how I primarily get information.
In my organization, phone is a good way to transfer info.
Used to distribute info, status & responses.

To Do List
==========

I know what I need to do for the day.
Need to establish goals to complete each day.
Use to identify and work issues before they become critical.
Sets up my schedule--prioritizes my time.
Determines how and when other tools will be used.

To Do List (cont)
====================

Sets priorities.
Defines mission & personnel support.
Allows me to plan & organize my work.
Helps me set priorities in a hectic environment.
I have to choose what I'm not going to get done.
Provides organization & strategy.
Keeps track of suspenses, meetings, etc.
Needed to organize my work.
Keeps me organized, focused & on track.
It allows me to prioritize my work.

Writing Devices--Pencils & Pens
=================================

Pens and pencils are basic tools.
Always writing something.
Primary means of communicating and taking notes.
Without writing device, other equipment would stagnate.
I am always writing.
Notes, letters, etc. are drafted using a pencil or pen.
I use it to transmit most of my information.
I use pencils for 'to-do' lists & to take telephone notes.
Paperwork, paperwork, paperwork.
I primarily *write papers*, *memos* and *notes*.
I use it a lot to coordinate with people all over the USA.

Computer
========

Use computer for word processing and spreadsheet.
The main source of information for my job.
Used for word processing and documentation.
Use computer for writing and office communication.
A computer drastically improves productivity.
Extensive work with 'what-ifs' that require quick response.
Use for extensive communication and information exchange.
Use computer to track data.

Fax Machine
===========

Best to transmit detailed info quickly across the country.

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VITA

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▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆ entered The United States
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This study attempted to broaden previous management work research by investigating primary work activities of middle-level Air Force acquisition managers and the tools being used to facilitate acquisition work.

Previous research has focused on directly observing civilian managers in actual work settings. In general, these studies have characterized managerial work as busy, fragmented, primarily linguistic, and comprised of numerous daily contacts. Managers often communicated via informal conversations. This preference for informal face-to-face conversation resulted from the manager's need to match a communication medium capable of conveying rich information to an uncertain work environment. It was hypothesized that Air Force acquisition managers worked in this type of environment.

A questionnaire was used to survey a group of 100 Air Force middle-level acquisition managers. Most of the managers indicated they were working in a fast-paced environment characterized by a large number of daily contacts and work issues. Most of the managers worked long days and spent little time by themselves. The most common work activities were conversations with others, reading and writing. Coordination was consistently ranked as one of the more frequently exercised management functions. These managers felt that conversations for action best typlified their most frequent linguistic activities and showed a strong preference for informal communication media.

These managers frequently used the telephone, a pencil or pen, and the computer. Computers were primarily used for word processing--in other words--its use was a function of its capability to facilitate linguistic acts.

Several recommendations for additional research were proposed and an argument was made for changing the present structure of management education.